*Scottish Development Department*

*Scottish Housing Advisory Committee*

# The Cost of Private House Building in Scotland

## *A Report for the Scottish Housing Advisory Committee*

*by Professor Norman Sidwell*

A

UNIVERSITY OF CAMBRIDGE
OP
22 AU
1970

Edinburgh
Her Majesty's Stationery Office
1970

SBN 11 490440 5

# Contents

*chapter* *page*
INTRODUCTION . . . . . . . . . . 7
Scope and Method of Research . . . . . . . 7
Acknowledgements . . . . . . . . . 8

1. HOUSE PRICES . . . . . . . . . . 9

2. LAND AND LEGAL COSTS
Land Cost . . . . . . . . . . 10
Solicitor's and Other Fees . . . . . . . . 11

3. DESIGN
Distribution of House-Types . . . . . . . 13
House Sizes . . . . . . . . . . 13
External Wall Material . . . . . . . . 14
Assessment of Results . . . . . . . . 14
Topographical Influences on Design . . . . . . 14
Building Materials . . . . . . . . . 15
Bricks . . . . . . . . . . . 16
Concrete Blocks . . . . . . . . . 17
Plastering Materials . . . . . . . . . 18
Roof Covering . . . . . . . . . 18
Ready-Mixed Concrete . . . . . . . . 19
Glass . . . . . . . . . . . 19
Timber . . . . . . . . . . . 19
Manufactured Joinery . . . . . . . . 20
Assessment of Results of Materials Study . . . . . 21
Water Service Regulations . . . . . . . . 21
Building Regulations . . . . . . . . 22
Cost of Traditional Practices . . . . . . . 24

4. PRODUCTION . . . . . . . . . . 26
Earnings . . . . . . . . . . . 27
Labour Supply . . . . . . . . . 30
Pattern of Firms and Scale of Operations . . . . . 32
Labour-Only Sub-Contracting . . . . . . . 33
Climate . . . . . . . . . . . 33
Trade Practices . . . . . . . . . 35
Scaffolding . . . . . . . . . . 36
Window Installation . . . . . . . . . 37
Roof Tiling and External Wall Finishing . . . . . 38
General Carpentry and Joinery Practices . . . . . 38
Mechanical Plant . . . . . . . . . 40
Chimney Sweeping . . . . . . . . . 41
Brickwork . . . . . . . . . . 42
Plumbing and Plastering . . . . . . . . 42

page

5. CONCLUSIONS

House Prices . . . . . . . . . . 43
Land Cost . . . . . . . . . . 43
Solicitor's and Other Fees . . . . . . . . . 43
Design Characteristics . . . . . . . . 44
Site Development . . . . . . . . . 44
Materials . . . . . . . . . . . 44
Water Service Regulations . . . . . . . . 45
Building Regulations . . . . . . . . 46
Traditional Influences on Cost . . . . . . . 47
Productivity . . . . . . . . . . 47
Pattern of Firms and Scale of Operations . . . . . 48
Climate and Daylight . . . . . . . . 48
Summary of Cost Differences . . . . . . . 48

## APPENDICES

A. House Price Surveys . . . . . . . . . 51
B. Histograms of Design Characteristics . . . . . . 58
C. Labour and Production Tables . . . . . . . 60

### APPENDIX A

Survey 1 House Prices by Region for 167 Housebuilders . . . 51
Scotland—Regional Variation in House Prices . . . 52
England—Regional Variation in House Prices . . . 53

Survey 2 House Prices by Region for a Single Housebuilder . . . 54
Scotland—Regional Variation in House Prices . . . 55
England—Regional Variation in House Prices . . . 56

Survey 3 House Prices by Counties—One House Type . . . 57

### APPENDIX B

Histogram 1 Percentage of Houses—House Types . . . . . 58
Histogram 2 Percentage of Houses—Floor Area . . . . . 59

### APPENDIX C

Table 1 Output per Operative—Size of Firm . . . . . . 60
Table 2 Output per Operative—Trade of Firm . . . . . . 61
Table 3 Output per Operative—Type of Work . . . . . . 62
Table 4 Output per Operative—Location of Firm . . . . . 63
Table 5 Occupational Analysis of Wholly Unemployed . . . 64
Table 6 Labour Unemployment in Construction . . . . 65
Table 7 Effect of Region and Occupation on Average Weekly Earnings . 66
Table 8 Average Weekly Earnings—Building Trades Craftsmen . . 67
Table 9 Building Craftsmen—Composition of Hours and Earnings . 69
Table 10 Selected Grades—Composition of Hours and Earnings . . 70
Table 11 Average Hours of Overtime by Region . . . . . . 71
Table 12 Daylight Available During Winter Months 1969 . . . 72
Table 13 Employment of Operatives . . . . . . . 73

## Prefatory Note

The following Report, prepared by Professor Sidwell of Heriot-Watt University for the Scottish Housing Advisory Committee, is published for the information of all who may be interested. In the meantime, neither the Committee nor the Secretary of State should be regarded as in any way committed to the Report's findings.

# Introduction

1. Following discussions in the Scottish Housing Advisory Committee on the differences in building costs between England and Scotland I was appointed by the Secretary of State in October 1967 to make a critical comparison of private house building in England and Scotland with particular reference to cost.

2. This report is a summary of the resulting research project which was carried out over a period of two years. A full report of the research including additional statistical material and studies in depth of the differences in building and water service regulations between England and Scotland has also been prepared and is available for consultation at the Heriot-Watt University, Department of Building.

## Scope and Method of Research

3. The genesis of this investigation sprang from the general concern that Scottish private houses seemed to be priced higher than comparable English houses. With this in mind it was considered essential to test the validity of the evidence which had caused this concern. Consequently, an analysis was made of data extracted from a very comprehensive range of nearly 1,000 sets of literature concerned with houses offered for sale all over England and Scotland. Initially it was hard to resist the logic of the suggestion made by many builders that one merely had to concentrate studies on those large organisations building private houses both sides of the Border. It was known that the Scottish Development Department had already undertaken a small-scale study of relative private house building costs in collaboration with two very large house builders operating in England and Scotland. The fact that this study failed to produce the desired information suggested that the building organisations involved were unable for one reason or another to provide the answers to the comprehensive range of questions essential in a comparative study of this kind.

4. Bearing this in mind it was still thought that the twelve or so "international" private house builders operating in both Scotland and England ought to be able to provide much useful information. Accordingly, the chief executives of the twelve firms were asked if they would be associated with the research. These approaches turned out to be something of an exercise in public relations and involved high level meetings, assurances of strict confidentiality, etc, but generally the heads of firms were most receptive to the approach and promised help which in some cases was freely and most patiently given at all points down the line of management, but in others was not so easy to obtain. The total of twelve "international" builders on which it was hoped to base case studies had finally to be reduced to six, but in addition to the case studies based on these "international" organisations a further ten private house builders (five operating only in England, five in Scotland) allowed their organisations to be the subject of case studies. These firms were carefully matched to make up "pairs" that were as representative as possible in order to eliminate differences.

5. A substantial part of the research concentrated on the way in which the design and production functions differed on each side of the Border. In all the many activities of building, the private house building sector is the only one in which the manifestly complementary functions of design and production come together in one organisation.

Thus the advantages deriving from feedback relative to regulation requirements, material performance, production technique, etc, are available to a greater extent in organisations within the private house building sector than in any other section of the industry. For this reason certain studies were simplified a little. After the initial study of house prices the various topics for individual study conveniently arranged themselves under (1) land—the basic commodity, (2) design considerations, and (3) aspects of productivity.

6. Design considerations embraced topographical features of the site, clients' preference regarding house type, statutory regulations and materials. In attempting to find out if the average Scottish site presented more topographical problems than the comparable English sites—particularly with reference to sloping or undulating sites—detailed surveys were made of twenty private housing estates ranging from Folkestone to Inverness. Many references were made by letter, questionnaire, interview or visit. The case studies made in the initial period of the research involved many time-consuming site visits over all parts of England and Scotland. A substantial amount of information and background knowledge of organisational difficulties came out of this activity, but generally these case studies were only partially successful because in most cases builders were genuinely unable to supply the information that was needed, particularly with regard to costs.

7. The comparison of resources and productivity came at the time when the Prices and Incomes Board was investigating the construction industry, consequently every effort was made to take advantage of the research done by the Prices and Incomes Board with special reference to Scottish and English firms engaged primarily or partly in private house building.

## Acknowledgements

8. This study is probably unique, there appears to be no previous record of such a comprehensive comparison being made of private house building costs as they occur on each side of the Border. To a great extent this made the study more difficult at almost every point, because there were little or no related research data in existence at the time the research began.

9. Sources of information were tremendously widespread and various. Some thousands of associations and individuals gave useful answers to questions. There were dedicated people who did more than this—they read and criticised the rough drafts of early findings. One private house building firm devoted much time to the criticism and revision of the initial questionnaires, and there were some instances of builders—who obviously were under great pressure—who displayed every courtesy and infinite patience in answering questions to the best of their ability. The Co-operative Permanent Building Society freely gave statistical information and research data, much of which has been included in the Report. Without the help and co-operation of the many, and the painstaking—sometimes highly critical—commentaries of the dedicated few, it would have been difficult to complete this work.

NORMAN SIDWELL

DEPARTMENT OF BUILDING
HERIOT-WATT UNIVERSITY
EDINBURGH
December 1969

CHAPTER 1

# House Prices

10. Prices relate to three bedroom semi-detached two-storey houses (inclusive of central heating and garage) and were obtained from three surveys:

(1) Estates of 167 housebuilders comprising over 600 houses.
(2) 277 houses of a large housebuilder operating in both England and Scotland.
(3) 65 houses of a single type chosen from this builder's several versions of three bedroom, two-storey houses.
(This survey, taken throughout all regions served to remove variable factors such as organisational efficiency, productivity, materials, finish, etc.)

The three-bedroom semi-detached two-storey house was chosen because it has been shown to be the most common house type in Scotland and England (1st histogram, Appendix B). Central heating and garage were included in the "basic house" to standardise comparisons. In the samples which did not include these items the housebuilders supplied quotations of prices for installation in their particular house.

11. The Surveys at Appendix A show that regional price variations in England are substantial, amounting in the extreme case to £1,632. In Scotland the maximum regional variation (£616) is less dramatic. Broadly, Survey 1 shows the overall average price for England to be £4,637, and Scotland £5,218 giving a difference of £581, but such a comparison in a situation of widely varying regional prices tends to be statistically suspect, particularly in view of at least 27 abnormally high priced houses within the London conurbation. Consequently a more realistic comparison has been made by deleting the 27 house prices and then comparing the English average with that of Scotland. This produces a difference of £717. (As at November 1969).

12. In Survey 2 (again ignoring the houses in the London conurbation), the single builder's overall price variation between England and Scotland is £469 and in Survey 3 the prices are England £4,593, Scotland £4,964, giving a difference of £371.

13. The price variations in a standard product of 167 housebuilders are very substantial and it is doubtful whether they would be fully justified by the varying land or production costs, particularly if careful comparisons are made of certain closely grouped locations, shown on the maps. The variations shown for the single large builder are proportionately less, as one would expect when the many variable factors implicit in 167 different housebuilding organisations are removed. But even in the survey of 65 almost identical houses built by the same builder, the variations are surprisingly great, amounting to £2,655 in the extreme case and £381 on average.

CHAPTER 2

# Land and Legal Costs

## Land Cost

14. The main difficulty encountered in a study of land costs is the lack of relevant information. The various official bodies concerned with transactions in land were approached, and although sympathetic, were for the most part unable to provide the kind of data to support a thorough and statistically satisfactory comparative study of land costs for private housing in England and Scotland. Despite this lack of information an attempt was made to collect and process such information as could be discovered within the limited resources of the research project.

15. Reference was first made to the published studies of J. McAuslan, A.R.I.C.S.,[1] and P. A. Stone, M.Sc., Ph.D.[2], on residential land values in England during the years 1960–1965. The prices of residential land quoted in these studies were compared with the prices paid for land in Scotland in situations which, so far as possible, were judged to be similar to those in the English sample. This information concerning prices paid for land for private housing development was extracted from the records which are available in the General Register of Sasines at Register House, Edinburgh. The limitations of these comparisons were clearly recognised particularly with regard to the period reviewed, and the difficulties inherent in the size of the samples taken each side of the Border, also the complexities arising from sizes and values of housing sites. Recent developments affecting the land market, for example the effect of the Land Commission's betterment levy have further complicated the issue but there is little evidence to suggest that these changes have altered the *relative* prices paid for land in England and Scotland respectively during the period covered by the research. In an endeavour to test the general validity of the conclusions reached in the main part of the study and to relate them so far as possible to more recent data, other sources of information about land prices were sought. In 1968 the National Building Agency analysed and interpreted data on Housing Corporation projects in England and Wales in a report entitled "Land Costs and Housing Development". Despite reservations about the size of the Scottish sample and its comparability with the English and Welsh data, it was considered to be worthwhile to extend this study to include Scotland. Information about Housing Corporation schemes in Scotland was obtained from the Scottish office of the Housing Corporation and an analysis made of comparative land values. Another most useful source of information on land prices was the series of "Occasional Bulletins" issued by the Co-operative Permanent Building Society. The reservations already made in relation to the statistical significance of the Housing Corporation data must also apply to the information given in the "Occasional Bulletins" but, nevertheless, they give a broad indication of relative ratios of site values in various parts of the country. The extract shown on page 11 from the Bulletin's survey of site values in the second quarter of 1969 is most relevant.

16. In this typical example from the series published in the Bulletins, it can be seen that, next to London and the Southern Counties, Scotland has the highest average price of new houses but has the lowest estimated site value and the lowest ratio of site values to average prices of new houses. Clearly the price of land depends on a complex inter-

---

[1] Published in Chartered Surveyor, May 1966.

[2] Part of "Report of Proceedings of Colloquium held in London, March 13th and 14th, 1965 on Land Values".

action of circumstances which can vary widely over closely situated areas. But the general conclusion reached from the results of all three studies is that the prices paid for housing land in Scotland are low compared with prices in England.

*Average Prices and Site Values of New Housing Mortgaged to the Society in the Second Quarter of* 1969

| Region | Average Prices of New Houses | Estimates of Average Values of Sites | Ratio of Site values to Average Prices of New houses |
|---|---|---|---|
| | £ | £ | % |
| London and South East | 6,283 | 1,816 | 28·9 |
| Southern | 5,541 | 1,483 | 26·8 |
| Western | 4,433 | 846 | 19·1 |
| Midland | 4,501 | 991 | 22·0 |
| Eastern | 4,605 | 1,014 | 22·0 |
| North Western | 4,398 | 762 | 17·3 |
| North Eastern | 4,194 | 652 | 15·5 |
| Scotland | 5,182 | 652 | 12·6 |
| Great Britain | 4,845 | 1,042 | 21·5 |

17. Any figure representing the cost advantage enjoyed by a Scottish housebuilder with respect to the price he pays for land is bound to be conjectural to some extent. But even if one ignores the data extracted from English auction sales, Register of Sasines and Housing Corporation schemes, and accepts the Co-operative Permanent Building Society data set out above, then it would seem that the cost advantage to the Scottish private housebuilder cannot be far short of £300 per house if not more.

### Solicitor's and Other Fees

18. The existence of a completely different law of property either side of the Border inevitably produces different codes of procedure to bring about the legal transfer of title to ownership of property. The property laws of Scotland are so different to those of England that no Scottish solicitor would normally undertake a conveyance of title to property in England, nor would an English solicitor undertake a similar commission in Scotland. There are certain procedures in the transfer of property that are common to both countries. Stamp duty is the same and survey fees do not differ greatly. The differences occur mostly when the respective solicitors are investigating the proof of title.

19. In England and Wales since the Land Registration Act 1966 there has been continuous progress towards total registration of all land and the property on it. The Act was intended to simplify the transfer of title to land and property, thus reducing the solicitor's work and making possible a significant reduction in fees. Registration of title under The Land Registration Act 1966 has progressed to the extent that more than half the population of England and Wales now enjoy the benefits of quick and relatively inexpensive transfers of property.

20. In Scotland there is the Register of Sasines to which the Scottish solicitor refers when he is investigating title, and clearly the legal complexities of proving title in Scotland involve Scottish solicitors in a great deal more work and responsibility in establishing title than their English colleagues where the property is registered under the 1966 Act. (The Henry Report on a Scheme for Registration of Title to Land in Scotland, May 1969, has direct relevance to conveyancing difficulties in Scotland.)

21. The following breakdown of solicitor's and other fees reflects the differences which occur between England and Scotland.

*Legal and Associated Costs on Transfer of Property involving a* £5,000 *house with a loan of* £3,750

| | ENGLAND | | SCOTLAND |
|---|---|---|---|
| | Registered Land | Unregistered Land | |
| | £ | £ | £ |
| Purchaser's solicitor's fees | 43 15 | 67 10 | 84 0 |
| Building Society's solicitor's preparation of mortgage | 21 10 | 21 10 | 34 10 |
| [1]Land Registry fees | nil | 9 0 | nil |
| Transfer of registration | 12 10 | nil | nil |
| Mortgage stamp duty | 6 5 | 6 5 | 6 5 |
| [2]Survey fees for Building Society | 11 0 | 11 0 | 11 0 |
| [3]Survey fees on own behalf | 30 0 | 30 0 | 30 0 |
| Incidental expense and search fees, say | 5 0 | 5 0 | 10 0 |
| TOTAL | 130 0 | 150 5 | 175 15 |

Notes:

1. The £9 registry fee applies if there is compulsory registration.
2. Fees based on value of property (i.e. price being paid) not on amount of mortgage applied for, or granted.
3. £30 is an arbitrary amount for surveyor's fees for a structural valuation. At present there are no set scales for fees. The amount of each fee is negotiated separately.

*Legal etc. Costs* for a £5,000 house with a loan of £3,750.

| | | |
|---|---|---|
| *Scotland* | £175 15s | |
| *England* | | |
| either | £130 | (Registered Land) |
| or | £150 5s | (Unregistered Land) |

| | | |
|---|---|---|
| Difference between Scotland and England | either | £45 15s |
| | or | £25 10s |

## CHAPTER 3

# Design

22. During the early part of 1968 the Co-operative Permanent Building Society analysed various aspects of the houses on which they had given mortgages and very generously agreed to make data available which permitted a comparative study to be made between England and Scotland with regard to the following design characteristics.

1. Distribution of house-types.
2. House-sizes (by floor area).
3. Type of external wall material.

### Distribution of House-Types

23. The first histogram of Appendix B (page 58) illustrates the classification of house types on the basis of the processed data. It will be seen that the Scottish sample has only half the percentage of terraced houses that the English has, the figures being 7% and 14% respectively. This suggests that this low cost type of house is less popular in Scotland. The semi-detached house was clearly the most popular type in both countries though it was slightly lower in the Scottish figures, being about 2½% less in this particular sample.

24. The least popular type of house in both countries was the semi-detached bungalow, the figures being even at about 11%. The detached house presents the first example of higher popularity in Scotland than in England. The figures are just below 22% (Scotland) and just below 20% (England). This is an example of a costly type of house being more popular in Scotland. With regard to detached bungalows the histogram shows that there were 5% more of this most costly house-type in the Scottish sample than in the English (20% and 15%).

25. On the basis of the data available it would seem that (apart from the case of the semi-detached bungalow—where the percentages are almost the same) the two most costly types are more popular in Scotland, and the two least costly more popular in England.

### House Sizes (by floor area)

26. The floor area of a house, a good indicator of its relative building cost, was the basis of this second comparison, which was of special interest because it is often stated that the average floor area of Scottish houses exceeds that of English houses owing to the more stringent requirements of the Scottish Building Regulations with regard to space standards.

27. The data are produced in the second histogram of Appendix B (page 59) showing the two distributions demonstrating that there are differences. There were no houses in the Scottish sample below 600 sq. ft. and at the other end of the table there were twice as many Scottish houses than English of over 1,400 sq. ft. in area. Although the greatest percentage in both samples falls in the 900–999 sq. ft. range there was a difference of nearly 20% between England and Scotland. All these observations suggest that there

were greater percentages of houses in the Scottish sample in the large area ranges. (See also 1,000 to 1,099 and 1,100 to 1,199). In fact the average area of the houses in the Scottish sample was 940 sq. ft. against the 905 sq. ft. in the English sample.

28. These investigations of house sizes confirmed the general view that Scottish houses incline to be of greater area but a much greater sample would be needed to provide data to support a precise statement of additional area.

### External Wall Material

29. The purpose of this comparison was to determine whether there was any difference between the English and Scottish samples in the type of material used in the construction of external walling. It was found that about 90% of both samples used either all brick or brick and block, less than 10% in each case using "other" materials (stone, in-situ concrete, timber panels, etc.) The all brick type of construction was most popular in both England and Scotland (64% and 85% respectively), a difference of 21%. In the case of brick and block the English usage exceeded the Scottish by the same 21% (in this case 27%–6%). Using the most reliable figures available it seemed that over 20% of the English sample gained savings of between £20–£40 compared with the Scottish sample.

### Assessment of Results

30. This data revealed a number of interesting design characteristics and provided a reliable indication of the most preferred house type—the semi-detached, two storey house. This caused subsequent research to be concentrated on this house type. The data on external wall material supported results from later studies and the figure confirming greater floor areas in Scottish houses agreed with data arising out of the House Price survey, Chapter 1, and the comparison of building regulations, Chapter 3.

### Topographical Influences on Design

31. The design of low-rise private housing can be greatly influenced by the character, topographical detail and gradient of the particular site. From an economic standpoint the ideal site is flat, with a well drained stable subsoil presenting no problems when excavating it to required levels. The acute shortage of this kind of land—all over Britain—has stimulated a demand for sites which builders hitherto have avoided. The majority of these indifferent sites occur on hillsides with medium to steep gradients. Sloping sites are usually costly to develop but the increased cost may be minimised if street layouts and the houses themselves are carefully designed to fit the site contours.

32. It has not been possible to make a sufficiently broad and reasonably representative comparison of sloping sites encountered in investigations on each side of the Border but it is probably fair to state that the vast areas of flat land in and surrounding large cities such as London, Birmingham and Manchester are scarcely matched by the undulating terrain over much of the densely populated areas of Scotland. Consequently, there is likely to be a slightly higher incidence of development cost for the private housebuilder in Scotland. In this context of higher development cost the point was made many times by builders in Scotland that because Scottish local authorities were building five times more houses than private housebuilders they had to have a stock of land five times bigger, and in acquiring it they were in a better position to secure the kind of land that was cheapest to develop, thus leaving the private housebuilder with rather less choice than the housebuilder in England, who built as many houses as local authorities did.

33. Although these arguments appear to have some factual basis it was impossible to quantify, in terms of development cost, these disadvantages claimed by the private land developers in Scotland. Case studies comparing twenty sloping sites developed for low-rise house-building in Britain (eleven in England, nine in Scotland) yielded interesting information, highlighting certain differences in the Scottish approach to the development of hilly sites.

34. On ten of the eleven sloping sites investigated in England, all houses were purposely designed to adapt to the slope of the land. Out of all nine sloping sites investigated in Scotland, only in one case had the architect taken account of the slope by developing a "split level" design. The remaining eight sites accommodated houses which had been designed for flat sites. This resulted in an excessive amount of expensive underbuilding and upfilling.

35. It appeared from this particular survey that it is common practice in Scotland for developers to offer a range of houses varying in design and accommodation. All the houses in this range are designed with a flat site in mind. This catalogue of house types is built up over a period of years and complete sets of working drawings and details are held by the builder. It appeared that when a new private housing development was being planned, the house designs were selected from the catalogue and a layout planned to give the best density, variety and appearance. While this procedure seemed reasonable for a flat site, the same procedure was followed for sloping sites giving little or no consideration to the contours and the underbuilding problems created. Underbuilding brickwork ranging from six to fourteen feet was found when the nine Scottish sites were visited.

36. Several factors appear to prejudice the Scottish private housebuilder against the design techniques practised in England to meet difficult site contours. The average Scottish house purchaser is rather less inclined than the English purchaser to favour a non-traditional design and even if he was attracted, say to a dramatic "split level" type of house his habitual sense of caution warns him that this factor of market preference might be against him if and when he comes to sell. In turn, and for similar reasons, the Scottish building societies are hesitant about giving generous loans on such houses. Another factor is that difficult and unusual sites need the landscaping and design expertise of a competent architect—a professional service which appears to be more acceptable to the English housebuilder.

37. A final factor was associated with the different scale of operations noted in the two countries (this is discussed more fully in Chapter 4 on Production). The Scottish housebuilder is operating on a relatively bigger scale all the time and tends to engage in massive mechanical earth-moving operations which break down the contours into flat sites. The great majority of English housebuilders operate on a smaller scale, they tend to develop each site on an individual basis, adapting their rather less mechanised resources to small-scale development procedures which, fortuitously, result in better landscaping, and less underbuilding. The small-scale English builder by containing his operations and tailoring his designs to take advantage of site contours benefits from lower site development costs.

## Building Materials

38. The basic building materials used in private house-building are cement, concrete and mortar aggregates, brick, blocks, carcassing timber, clay and concrete roofing tiles, various metal and wood components together with wall and floor finishings of all kinds. The house designer's choice of materials is inevitably conditioned by price, purchaser preference and functional performance. In collecting data on the price of materials it soon became evident that most basic material prices were subject to variations arising from the initial cost to supplier, location of site in relation to supply, size of orders, commercial aspects of trade between the supplier and builder, and other factors. Thus the study of materials prices was extremely complex and for accurate comparisons it became essential wherever possible to determine the cost to the builder. Certain technical periodicals dealing with the construction industry publish lists of London and Glasgow materials prices but apart from this there is little information on a comparative basis giving guidance to price differences between the two countries.

39. It was considered that those English private housebuilders who had recently started operations in Scotland ought to possess the most accurate information on variations in

material prices, and the English builders consulted were unanimously of the opinion that suitable materials were not always available in Scotland and when they were obtainable they were more expensive than those taken from English sources. The representative of a quite large organisation in North-East England maintained that he could transport lightweight concrete blocks from North-East England to the point of use at Edinburgh at an all-in price significantly lower than he could negotiate for blocks of lower quality in the Edinburgh district. The explanation here might be that this particular builder enjoyed a substantial discount through bulk buying from the English supplier.

40. Information that was considered to be reliable was given by one large Newcastle builder who had carefully costed the materials attributable to almost identical houses which he was then building in each country. The cost of materials for all work (excluding plumber, electrical, heating and external works) was £1,000 for the Scottish house and £945 for the English house, a difference of £55, representing about 1·1% of the total cost of the house.

### Bricks

41. The use of brickwork for external and party walling was found to be practically universal in private housebuilding at the time the study was made. Data was therefore obtained for the types of bricks used, together with prices and distribution. Over the whole of Britain bricks appear to fall into two general categories—Fletton and non-Fletton bricks. Fletton bricks are produced from Oxford clay found in a thick stratum around Peterborough. This clay requires little treatment before pressing and its high carbonaceous content means that the bricks are almost self-firing in the kilns. Non-Fletton bricks are made from other clays, shale or other materials such as sand, lime or concrete. Generally the production of this type of brick requires much more treatment of the raw materials and is much more costly to fire. Since Fletton bricks are cheaper to produce, a large area of Southern and Central England benefits in terms of price in both common and facing bricks. In Scotland common bricks are mostly "composition bricks" made from the shales available in coal-producing areas of the country.

42. Two sizes of bricks are commonly used in Britain: the 2⅝ in. brick, typical of all bricks in Southern England, and the 2⅞ in. brick produced more commonly in Scotland and the North of England. Traditionally in England a large proportion of external walling is built in facing bricks; in Scotland, notably in local authority housing, much external walling is built in common brickwork, and roughcast or harled for appearance and weather protection. In private house-building in Scotland facing bricks are increasingly used to give an attractive appearance to the houses. The proportion of facing brickwork used varies between builders and between sites.

43. In 1968 the National Coal Board supplied 40 per cent of the Scottish market in common bricks. The next large producer was a Glasgow firm and their combined output accounted for most of the common bricks produced in Scotland. The raw material used by the National Coal Board was the opencast shale from coal workings. This remained reasonably inexpensive but could not compete in price with the Oxford clay used in England. The National Coal Board had produced facing bricks in Scotland but this had been discontinued since the reliability required could not be guaranteed at economical prices. The National Coal Board confirmed that there was a serious lack of suitable raw materials for the production of attractive and reliable facing bricks in Scotland.

44. The market in common bricks in Scotland is extremely competitive; Scottish brick manufacturers face competition from concrete block manufacturers and from the Fletton brick industry in England. Possibly the situation will improve through the merger in February 1969 of N.C.B. Brickworks Executive (Scottish Area) and the Thomas Tilling holding of Alexandra Transport Company giving the new company (the Scottish Brick Company) a near monopoly of the common brick industry in Scotland.

45. In 1968 N.C.B. sold a proportion of their bricks direct to the larger builders (at special negotiated prices for large orders over a period) and the remainder through builders' merchants. It appeared, however, that even the large building companies buy a proportion of their bricks through builders' merchants in order to obtain favourable prices for other materials.

46. A comparison was made of the prices quoted for all types of common bricks.

| | |
|---|---|
| Southern England and Midlands | 135s to 150s delivered |
| Northern England | 180s to 185s ex works |
| Central Scotland | 175s ex works. |

(approximately 30s per thousand should be added to ex-works prices to cover delivery up to 20 miles from works.)

This comparison was considered to be a reliable guide to brick prices at January 1968. The figures would be subject to variations by the discounts allowed to some builders in respect of large and continuing orders. It was understood that these discounts were considerable in the case of larger builders, but precise information on this subject was difficult to obtain.

47. Any study of facing bricks tends to be complicated by the fact that price is not the only consideration. Choice is frequently conditioned by the aesthetic appearance of the brick and its availability. Investigation in 1968 indicated that the London Brick Company (L.B.C.) were the acknowledged price leaders in facing bricks throughout England and Central Scotland. Facing bricks produced by other organisations were generally more expensive and were only in demand when appearance was an important factor. In private housebuilding it was generally found that unless the builder had some other trading connection with the producer of the more expensive facing brick the least expensive brick would be used. The 1968 prices for the cheapest L.B.C. facing bricks are set out below:

| | |
|---|---|
| Delivered to *Charing Cross, Westminster W.C.2* Rustics | 187s 9d per 1,000 |
| Delivered to *Birmingham (City Centre)* | 197s 1d per 1,000 |
| Delivered to *Newcastle* | 234s 3d per 1,000 |
| Delivered to *Glasgow* | 286s 9d per 1,000 |

During the research only one company in Scotland was producing a significant quantity of facing bricks. The prices of these bricks in January 1968 were between 335s and 350s ex works. With delivery charges these bricks were much more expensive than those of the L.B.C.

48. This study confirmed that many of the facing bricks used in Scotland, particularly in private housebuilding, were produced in England and transported north. The transport costs involved placed builders in Scotland at a disadvantage to those operating nearer to the main areas of production in England. Generally facing bricks were 35% more expensive in Central Scotland than in the Midlands and south of England. In the case of the London Brick Company this difference amounted to approximately 90s per thousand bricks. Common bricks of Scottish manufacture are about 10s per thousand dearer. Generally the quality is poor and the rate of supply is rarely adjusted to the varying seasonal demands.

## Concrete Blocks

49. Clinker, lightweight concrete and clay blocks are used in Britain for internal partition work and for the inner leaf of cavity walling in traditional housing. In the north of Scotland concrete blocks are mostly used for walling since bricks are not available at economic prices. In Scotland the production of clinker or "breeze" blocks is carried out on a limited local basis by medium sized or small businesses and distribution is through builders' merchants. It was particularly difficult to obtain information on the production

or pricing of these blocks. The complex production process of these lightweight concrete blocks appeared to require the establishment of large factories, production thus being centralised. A Co-operative Permanent Building Society study on mainwall construction produced the following information:

*Percentage of Dwellings with Main Wall Construction (1966)*

| | Brick | Brick-Block | Stone | Concrete | Other |
|---|---|---|---|---|---|
| North Ireland . | 24·7 | 61·7 | — | 11·7 | — |
| London and S.E. . | 55·3 | 42·4 | — | — | — |
| South . . . | 38·2 | 56·9 | — | — | — |
| West . . . | 22·4 | 46·8 | — | 23·0 | 4·6 |
| Midlands . . | 59·1 | 39·6 | — | — | — |
| East . . . | 46·2 | 52·7 | — | — | — |
| North West . . | 63·3 | 30·5 | — | — | — |
| North East . . | 69·6 | 22·9 | — | — | — |
| Scotland . . . | 65·6 | 12·3 | — | 13·0 | — |

This table shows that Scotland had the lowest proportion of "brick-block" construction of all the regions. The figure of 13% for concrete block construction was taken to represent the housing in the North of Scotland. The fact that Scotland and the North-East of England had low proportions of "brick-block" construction was surprising in a situation where brick prices in these areas were known to be considerably higher than in the South, where brick-block construction accounted for 45% of walling.

50. Studies made by the Building Research Station have indicated that the use of concrete blocks for wall construction gave a saving in labour of about 25% over brickwork. It is possible that builders are not fully aware of the economies which can result from using blocks. Reference was made to the use of blocks in external walling in paragraph 29 when the cost saving potential was estimated at £20–£40 a house.

## Plastering Materials

51. The internal lining of walls and ceilings in housebuilding may be done in gypsum plaster or gypsum plaster products. The traditional practice, which is fairly common, is to apply two coats of wet plaster to the walls and use plasterboard, coated either with a skin of plaster or some other finishing material, as a ceiling lining. Prices of plasters and plasterboards were carefully compared, and with some slight exceptions, it appeared that there was little difference in the cost of these materials to builders throughout Britain.

## Roof Covering

52. The basic requirement in roof covering is for a durable, weatherproof, reasonably lightweight construction costing as little as is consistent with the durability demanded of house construction. The traditional materials used in Britain until the 1930s were slates and clay tiles. At that time the concrete tile was introduced in England during a shortage of clay tiles and has now come to be established as the most common form of roof covering in housebuilding. The concrete tile was not established in Scotland until after the Second World War.

53. B. D. Cullen in his article "Materials Usage in New Buildings" (Building 27.1.67) indicated that for general housebuilding in 1964 the proportions of materials used for roof covering were:

Concrete Tiles — 78%
Clay Tiles — 13%
Slates — 5%
} together with small proportions of other forms of covering

Preliminary studies showed that concrete tiles were used almost exclusively in private housebuilding throughout Britain. The use of other materials was generally more expensive.

54. Two major companies produce concrete roof tiles in Britain and separate approaches were made to each company for information affecting the cost of private housing each side of the Border. One company, well established both in England and Scotland, produced evidence suggesting that the price of roofing in Scotland is 20% higher than anywhere in England due to transport and labour costs. The other company considered 10% to be a more realistic figure. England is better served in terms of access to tile factories than is Scotland. The Western area of Central Scotland was well served from the first company's works but other areas, where considerable private housing development is in progress, is at a considerable distance from any factory producing concrete tiles.

### Ready-Mixed Concrete

55. An analysis of prices and transport charges provided by 26 companies in locations all over Britain confirmed that Scottish private housebuilders pay no more for their ready-mixed concrete than any of the builders in England.

### Glass

56. The McEwan Younger Working Party Report on Organisation and Practices for Building and Civil Engineering 1964 specifically mentioned glass as "another common building material which is not now produced in Scotland and has to be brought from England". The suggestion in the McEwan Younger Report was that consideration should be given to the Scottish production of glass, together with certain other materials mentioned, as a means of lowering costs, speeding up deliveries and improving efficiency in construction work.

57. It is well known that one large company with factories based in Lancashire, Wales and the South of England has a monopoly in the production of all forms of glass for all building work in Britain. But enquiries have shown that the delivered prices of sheet glass are standard throughout most of Britain, exceptions being areas in Scotland north of Inverness and in Cornwall. Clearly this company is very aware and indeed extremely sensitive concerning its responsibilities in a situation of undisputed monopoly. For this reason the cost of glass has been spread evenly over almost the whole of Great Britain regardless of variations in delivery charges, which are bound to be very high in many Scottish areas. It is considered that there is no cost difference of any significance to record as a consequence of this study.

### Timber

58. 105 timber merchants in England and Scotland were consulted on:

(a) Sources of timber supply
(b) Qualities of timber supplied
(c) Price
(d) Transport charge to site.

This research showed that Scottish merchants import practically all carcassing timber (structural timbers for floors and roofs) from the Baltic, while the English merchants import generally from North America; that Scottish builders tended to use the more expensive grades of timber; that there was no significant variation in price and in transport charges between Scotland and England. Merchants did, however, make it clear that transport charges were not as important to them as the reduction of off-loading time on site together with the discounts allowed for large orders. Merchants commonly held the view that, "The mileage was often not so important as obtaining a quick turn round at the receiving end".

## Manufactured Joinery

59. The industry responsible for manufactured joinery is broadly divided into two groups—"standards" manufacturers and "specials" manufacturers. Firms in the former category generally operate on a large scale, employing mass-production methods to a substantial degree, and turning out products conforming to recognised standards. The manufacturers of "specials" produce a wide range of "one-off" non-standard components to meet the requirements of architects and small-scale purchasers. Some manufacturers engage in the production of both "standards" and "specials".

60. Information obtained from extensive contact with Scottish private housebuilders confirmed that the general tendency in Scotland is for manufacturers to concentrate production on "specials" rather than "standards". There are only a few really large-scale manufacturers in Scotland who concentrate on a long production line of standard products; these are located near the port of Grangemouth, and at Cumbernauld and Dumbarton.

61. A Working Party on Standardisation of Builders' Joinery under the Chairmanship of Mr. J. C. Fisher[1] has already reported that although there had been a substantial achievement of standardisation in the manufacture of doors and kitchen units there was considerable scope for the reduction of costly variations in manufactured joinery. The McEwan Younger Report of 1964 stated that a considerable proportion of building components, especially fitments and ironmongery, used in Scottish housing was of English origin, and that there were increased costs.

62. Analysis of a questionnaire, sent to Scottish housebuilders revealed the following information:

(a) Every firm contacted obtained at least one item of manufactured joinery from England.

(b) All but one of the firms contacted agreed that price was the deciding factor and that prices were far more competitive in England. The firm which disagreed stated that "Our production is rarely of sufficient scale to take the advantage of bulk order discounts and we prefer to call on materials and components as and when required which, with the smaller quantities generally involved, limits us mainly to Scottish suppliers".
This comment emphasises the point that perhaps English firms do not produce an article more cheaply but owing to the scale of production and the size of orders can give far more competitive discounts than the Scottish manufacturers.

(c) All but one agreed that quality was an important consideration but that this was linked very closely with price.

(d) 64% of the firms contacted obtained doors from English manufacturers. (This includes one major "international" firm of Scottish origin which has quite a large manufactured joinery section of its own.)

(e) 64% of the firms contacted obtained windows from English manufacturers.

(f) 55% of the firms contacted obtained kitchen fitments from English manufacturers.

Since many contractors stated that they bought manufactured joinery from England mainly because of more competitive pricing, several major contractors were asked if they would verify this statement by giving examples of quotations received from manufacturers in England and Scotland. Certain contractors gave useful information on this, confirming without exception that the prices quoted by English manufacturers were lower than those quoted by Scottish manufacturers. The cost differential varied from a few shillings to several pounds and in the manufacture of larger units such as stairs the variation was as high as £10. Information obtained with respect to doors suggested that door prices in Scotland vary from 5s to 19s dearer than an equivalent door manufactured in England.

---

[1] "Report on the Standardisation of Builders Joinery"—National Economic Development Office, 1967.

### Assessment of Results of Materials Study

63. This study of materials has indicated several areas where additional costs attributable to materials occur in the Scottish house. A very conservative estimate of these costs would be around £50. This comes close to the estimate of the Newcastle builder (paragraph 40) mentioned at the beginning of this section.

### Water Service Regulations

64. In 1964 the McEwan Younger Report on Building and Civil Engineering Procedure in Scotland drew particular attention to the fact that the Scottish Building Standards Regulations did not deal with water supply and went on to state "it is in plumbing and water supply that practices in Scotland differ most from those in England and Wales. . . ." The Report went on to criticise the existing variations in local practices and requirements within Scotland and the common practice of requiring the testing and stamping of fittings which "can cause considerable delay and inconvenience". It is now five years since the McEwan Younger Report was published and this investigation has shown that costly differences still exist between Scottish and English practice.

65. From a statutory standpoint, these differences should not be possible because the 1950 Model Water Byelaws (Scotland) were revised by the Scottish Development Department and a new Model issued in 1967, the object being that to ensure maximum efficiency in the manufacture and installation of water fittings, the model water byelaws for Scotland, England and Wales should be on a similar basis. This resulted in the 1967 Scottish Model being almost identical to the 1966 English Model.

66. The 1950 Byelaws provided the Scottish Water Authorities with a Code of Practice covering water supply installations. They constituted a detailed set of plumbing standards. The new byelaws are much more general in nature and concentrate more on principle than on practice. The intention is that plumbing installations in Scotland will no longer be governed by a stringent and rigid set of rules but will instead conform to laid down principles that are broad enough to permit flexibility in design and specification. This investigation has shown that the changeover to the new byelaws will be a very slow process. Clearly those directly connected with the planning, administrative and assembling function of plumbing have been working to the 1950 Byelaws for some 20 years, and there is naturally a certain resistance to change. Inded there is ample evidence that few plumbers in Scotland realise that they are not still bound by the 1950 Byelaws and those who are aware of changes in requirements are manifestly unlikely to lower their standards willingly, neither are water inspectors inclined to ask for less than they have always done. As one Scottish water engineer wrote: "If I am correct in thinking that the total additional cost due to the requirements of Scottish water undertakers as opposed to English undertakers amounts to £35 9s 5d I feel there are many who would argue that the advantages obtained from these additional requirements were well worth the extra cost involved".

67. Clearly the "levelling down" process of Scottish standards to English standards has statutory sanction in the 1967 Model Byelaws but it will be some years before the effect begins to be seen, even in what some might regard as the "common denominator" of the industry—the private housing sector. Until then, the water service in a Scottish house will cost £35 to £50 more. The water services requirements which make for additional costs in the Scottish house are as follows:

1. Provision of minimum capacity storage tank
2. Overflow pipe from storage tank
3. Flushing cistern to be 3 gallons capacity

4. Overflow provisions for baths and sinks
5. Fittings for pipes (Scottish authorities restrict the use of capillary fittings)
6. Hot water apparatus (1) (Provision of sludge cock and draw off pipe)
7. Hot water apparatus (2) (Expansion pipe taken through roof)
8. Testing and stamping
9. Provision of stopcocks

Producing a total additional cost of £35 9s 5d.

*Note*

In this list no account has been taken of additional Scottish requirements for:
(a) maximum capacity of storage cisterns
(b) maximum capacity of feed cisterns
and (c) materials for pipes.

These additional requirements have a somewhat lesser degree of relevance to private housing, but if included the total of £35 9s 5d would be raised to approximately £50.

## Building Regulations

68. The Building Standards (Scotland) Regulations, 1963, and the Building Regulations, 1965, together with their respective amendments represent the principal legislation controlling building in Scotland, England and Wales. In form, the documents are very similar, but, because of the differing enabling powers under which they were compiled, they are very different in content and in scope. For example, there are no sections in the English Regulations covering Means of Escape from Fire, Housing Standards, or Electrical Installations. Even within those Parts which are directly comparable, there are many variations.

69. During the course of the research and the many contacts with building firms in Scotland and in England it was regularly stated, particularly by the Scottish housebuilders, that there was a wide variation of interpretation of various important requirements of the Scottish regulations, particularly with regard to drainage. One housebuilder operating for the first time in Scotland complained that a particular local authority insisted on being furnished with a special set of drainage details for each house type, and he estimated that this cost the firm an additional £40 per drawing. Generally, the English housebuilders did not find the same variation of interpretation between various authorities in England and most stated that any variations were of a minor nature and did not materially affect the building costs.

70. To determine whether major variations in interpretation did exist throughout both countries and to confirm to what extent the claims of the housebuilders were valid, a questionnaire on building regulations was sent out to a wide selection of buildings authorities in Britain. A detailed examination of the completed questionnaires revealed that there were many sections within the regulations where differences of interpretation and practice occurred particularly among the Scottish authorities. The answers to the questions regarding drainage tended to support the builders' claims that Scottish authorities varied in their interpretation of the requirements of the regulations. Generally, the answers to the questionnaire confirmed that the interpretation of the requirements of the regulations varied from authority to authority. These variations in interpretation were more marked in Scotland than in England, but this may well have been due to the Scottish Regulations covering a much wider field than the English Regulations.

71. An exhaustive comparative study was made of the Building Standards (Scotland) Regulations, 1963, and the English Building Regulations, 1965 and this is dealt with in the full report. The most important factors affecting Scottish costs are summarised below. The references are to the Building (Scotland) Regulations, 1963 as amended.

*Regulation 69* (Brickwork around flues)

The exposed face of the chimney must be sealed with a rendering of cement mortar or other suitable material.

Additional cost to Scottish house £1 10s.

*Regulation 79* (Chimney height)

Requires a chimney above a certain height to be provided with suitable means of access to the top of it. This usually involves a permanent metal ladder and presumably is for the convenience of the Scottish chimney sweep. No similar provision in English Regulations.

No cost is given in this case because the house design usually avoids this costly requirement. Discussion in the section on Trade Practices has demonstrated that the requirement serves only to perpetuate an outdated trade practice and as such is scarcely justified.

See also Regulation 93 concerning access to roof.

*Regulation 82* (Fireguard Fittings)

"Where in any building of occupancy group A there is a fireplace opening capable of containing an open fire, there shall be provided on each side of the fireplace opening screwed bushes or plugs fitted with screwed eyelets so as to enable a fireguard to be securely fitted in front of the opening."

A sensible precaution in the interests of the safety of young children. Not required in English houses, consequently rarely provided.

Well worth the estimated additional cost to Scottish house of £1.

*Regulation 93* (Access to Roof)

Where a stated part of a roof, usually the eaves, is more than 15 ft above ground level "the building shall be provided with suitable means for obtaining access to the roof and to any chimney stacks forming part of the building".

This provision for access to the roof is presumably to allow the chimney to be swept or the roof to be repaired. (See discussion under Trade Practices in Section 5).

Not required by English Regulations.

Additional cost to Scottish house £10 9s 6d.

*Regulation 142* (Testing of Drains)

In Scotland, new drains must be tested twice, once before any haunching or backfilling is done and again after the drain trench has been filled in. English regulations require only one test. Cost of additional test £5. (Not all authorities charge for this but additional expense to the builder seems fairly certain.)

*Regulation 151* (Ventilation of Traps on Drains)

There is no comparable regulation in England to this regulation, which requires traps on underground drains outside the building to be ventilated. This is usually achieved by taking a length of ware pipe from the trap to ground level, and covering the top with a metal grid. The pipe is normally enclosed within a brick chamber. Cost £8 6s.

*Regulation 152, 153, 161* (Soil, Waste and Ventilating Pipes)

Test procedures in Scotland are much more demanding, requiring a better standard of workmanship.

The Scottish requirement for pipe ducting inside the house goes much further, access panels must be provided.

Cost of ducting and access covers £3 15s.

*Regulation 177A* (Windows)

Windows above the ground storey are generally required to be capable of being cleaned from the inside. No such requirement in England.

Special hinges can be fitted allowing narrow windows to be cleaned from the inside. If a window of contemporary style with a reasonably wide area of glass is required, then it would probably have to be a pivot-hung type to permit cleaning. This type of window is very expensive.

Cost of "easy clean" hinges additional to normal cost of, say, seven windows—£2 16s. This could be increased to £7 10s or more if only three of the seven windows were pivot-hung.

*Regulation 183* (Space standards)

This regulation sets, quite categorically, minimum space standards for a Scottish house, in terms of the floor areas of the various apartments, and a reference to Table 18 in the Regulations shows what these minimum room areas must be, having regard to the number of apartments in the house. Nowhere in the English regulations is there any provision made regulating the minimum size of the house.

The recommendations contained in the publication "Homes for Tomorrow"—more commonly known as "The Parker-Morris Report"—set out certain minimum areas, not of individual rooms, but of overall areas of accommodation required to house specific family-unit sizes. The argument for this concept, broadly speaking, is that, as families grow up, and grow older, their living needs change considerably, and the inference is that flexibility of design within the overall area is more important than a set of rooms, fixed in area and in purpose. While this is a very interesting and important concept, in house design and social acceptability, it cannot be considered relevant to this particular study, since the recommendations of the Parker-Morris Committee have not been made mandatory in the private housing sector of the industry.

A detailed study of house selling prices and accommodation standards has shown the Scottish house to be larger by at least 35 square feet.

Taking a calculated cost to build of 60s per square foot the cost difference between Scotland and England due to space standards is at least £105. (Note. The cost, 60s per square foot was taken from a comprehensive analytical cost study.)

*Regulation 191* (Drying facilities)

It has always been a traditional requirement of the Scottish housewife for drying facilities to be provided. English regulations neither require this nor does the builder go out of his way to provide the facility.

Cost of a rotary clothes drier or poles set on or in a proper foundation £7.

72. There are many other regulation differences involving an element of additional cost to the Scottish house. There are for example specific requirements in the Scottish code for paths, fuel storage, storage cupboards, electric points, and access to internal roof space. The English regulations make no requirement with regard to these essential matters. Clearly the English builder is unlikely to offer a house for sale unless it has paths, a fuel bunker, electric points etc., but he is not bound by statutory power to do so. A further complication is that the National House Builders Registration Council specifications in England have, since January 1st, 1969, required member builders to provide paths, electric points and storage cupboards in private houses. These N.H.B.R.C. requirements in England are not so specific and do not go as far as the Scottish regulations but to a limited extent they help to make good the omissions and deficiencies of the English regulations.

## Cost of Traditional Practices

73. The suspended joist and boarded floor is preferred in Scotland, even on a level site. In England the general tendency is towards a solid floor at ground level. Building sites vary widely in matters of slope, sub-strata, and topographical detail, and it is extremely difficult to compare solid ground floors and suspended wood joist ground floors with specific and accurate reference to cost.

74. A solid floor constructed of concrete, screed and tiles is, of itself, more expensive than a suspended floor of joists and tongued and grooved boarding. But there is a potential saving in using a solid floor where the site is level, since all partition walling in underbuilding and associated foundations inherent in suspended construction are eliminated. Thus on a level site on which little excavation is required to insert a solid floor, a suspended floor is at a cost disadvantage. For a 3 bedroom semi-detached house, with conventional brick internal partitioning, this could amount to £25 additional cost.

75. The traditional boarded sarking in the Scottish roof adds to cost as does the traditional tendency for Scottish roof framings to be more sturdy, although the latter is difficult to cost. The additional cost for wood boarded sarking is about £44 and for sarking of Scottish house with insulation board £26.

CHAPTER 4

# Production

76. This part of the investigation was largely taken up in the analysis in Scottish terms of such national surveys and reports as had relevance to productivity or earnings in the building industry. The first analysis had reference to information on regional employment and productivity published by the Ministry of Public Building and Works in 1968. The employment statistics related to the pay week ending 6th April and the output statistics related to the value of the work done in the first quarter of 1968.[1] In collaboration with J. B. Williams, a Research Fellow of Birmingham University, and the Construction Economics Division of MPB & W, an analysis was made of the data for 1968 by a method based on dividing total value of work done by total number of operatives engaged on work of a particular type. Tables 1–4 of Appendix C (pages 60–63) embody the results of the analysis and give information in the form of output per operative.

77. Table 1 includes all work undertaken by workers in building and civil engineering including repairs and maintenance. Output per operative in Scotland is significantly lower for those firms employing less than 300 operatives. Table 2 details output per operative for the regions based on the classification of the firm. Output of civil engineering in Scotland is about average compared with the English regions. Apart from those regions in the North of England which have slightly lower outputs for plasterers (the North West being lowest for plumbing) Scotland is lowest for all other trades. Table 3 details output per operative by region for different sectors of work. This is of particular relevance since data on private housing are included. Outputs in this sector in the southern regions and Midlands are nearly double the output of Scotland. The range of achievement in public sector housing is not nearly so marked, Scotland being lowest but one. In other new work, which includes the civil engineering contribution, Scotland remains the region of lowest output, but the variation between individual regions is less marked. Figures for repair and maintenance show Scotland to be the region of lowest output overall. Table 4 gives output on the basis of numbers of workers by region and also output per employee, which includes all non-manual workers, referred to in the census form as Administrative, Professional, Technical and Clerical i.e. (A.P.T.C.). In this analysis Scotland remains the region of lowest output but the range is reduced by the inclusion of A.P.T.C., since Scotland tends to a lower proportion of staff to operatives than most regions of England.

78. The conclusions which can be drawn from this analysis are that output per operative is lowest in Scotland, particularly in those sectors which employ a high proportion of craftsmen, i.e. new housing, repairs and maintenance. Those sectors which depend less on craftsmen and more on unskilled operatives e.g. civil engineering and other new work, (both public and private) have better records of output. It is for this reason that particular emphasis is given in this study to analysing differences between Scotland and England which relate to building craftsmen.

79. Criticism might be made of the basic data used in the proportion of Tables 1–4 in that the totals used in the analysis relate to output during the first quarter of 1968, i.e. a

---

[1] Bulletin of Construction Statistics Supplement for April 1968—Ministry of Public Building and Works.

winter period and the operative labour force used as a divisor were the totals at the end of the first week in April. This would depress the value of "output per operative", for regions where a large proportion of the labour force is laid off in the winter period. But available statistics indicate no regional bias in unemployment during the winter months. Data included in this section on labour supply, Tables 5 and 6 of Appendix C (pages 64–65) indicate unemployment amongst craftsmen in Scotland during the first quarter of 1968 to be low. The only trade showing a marked tendency to high unemployment in the winter is that of painter but this is general throughout Britain.

80. Clearly the use of value of work as an indicator has imperfections when considering the output per employee regionally. Regions where prices are low, e.g. Northern England will consistently record lower outputs than regions of high price for building work when the output is always overvalued by comparison with regions of low price. This analysis, if it has any bias at all, tends to credit Scotland with higher output thus inflating the output per operative. Information has been supplied to the research team by firms working both in Scotland and England confirming that labour costs are far higher in Scotland, for producing directly comparable items in the private sector, and the building industry generally.

81. The following table compiled by the Department of Economics, Queen's College, Dundee makes a comparison of the performance of the house building industries in Scotland and England. Direct comparisons of the performance of the industry north and south of the Border are impaired owing to differences in building regulations, hours worked, proportions of public sector output, etc., but the figures demonstrate that a wide gap does exist between the outputs of the two countries. Assuming similar levels of earnings in both countries the labour input of hours in Scotland is about 50% higher.

| Year | ENGLAND AND WALES | | | | | |
|---|---|---|---|---|---|---|
| | Completions | | | Completion and Completions Equivalents | | |
| | thousands | *Per operative year* | | thousands | *per operative year* | |
| | | number | index | | number | index |
| 1961 | 268·8 | 1·00 | 100 | 268·5 | 1·00 | 100 |
| 1962 | 278·7 | 1·04 | 104 | 277·9 | 1·04 | 104 |
| 1963 | 270·7 | 1·03 | 103 | 278·1 | 1·05 | 105 |
| 1964 | 336·5 | 1·09 | 109 | 334·8 | 1·08 | 108 |
| 1965 | 347·2 | 1·18 | 118 | 383·2 | 1·30 | 130 |
| 1966 | 349·5 | 1·22 | 122 | 345·7 | 1·21 | 121 |
| | SCOTLAND | | | | | |
| 1961 | 27·2 | 0·70 | 100 | 28·63 | 0·74 | 100 |
| 1962 | 26·8 | 0·67 | 96 | 27·60 | 0·69 | 93 |
| 1963 | 28·2 | 0·69 | 99 | 32·40 | 0·79 | 107 |
| 1964 | 37·2 | 0·80 | 114 | 37·59 | 0·81 | 109 |
| 1965 | 35·1 | 0·78 | 111 | 37·55 | 0·83 | 112 |
| 1966 | 36·0 | 0·79 | 113 | 36·86 | 0·81 | 109 |

## Earnings

82. The preceding notes have dealt with the marked regional variations in output of building operatives. Total labour cost is a combination not only of output tentatively considered in Tables 1–4 but also the level of wages being paid for this output. This leads

on to the consideration of regional wage levels in order to determine the effect of different earnings levels on cost of building.

83. At one time there were considerable variations in the hourly rates in different localities and regions, but over the years these have been reduced to two, London and Liverpool on the one hand, and the rest of Great Britain on the other. This regional differential which has remained at 1½d an hour for many years applies both to craftsmen and labourers.

84. The Working Rule Agreement (W.R.A.) lays down a standard 40 hour week of five 8-hour days except for 12 weeks in mid-winter when a 5½ day week (40 hours) is permitted. The first hour in excess of 8 on a weekday attracts an overtime premium of ¼ hour. Thereafter pay is at time-and-a-half, with double time after 4 p.m. on Saturdays and on Sundays.

85. The standard week at present has little meaning apart from indicating when overtime payments begin, the guaranteed week is 36 hours. When an operative is present during normal working hours on a site, but unable to work through causes beyond the control of the parties (in practice usually the weather), the W.R.A. provides that he shall be paid at half his normal hourly rate during the time lost. The weekly guarantee applies to total pay for normal hours in the week, both working and waiting, if the total falls below 36 times the appropriate hourly rate, then pay must be made up to that level. The guarantee therefore comes into effect only if more than 8 normal hours are stopped in any one week.

86. The working rule agreement also allows for the operation of incentive schemes to supplement basic earnings and lays down schedules of payments for absence through sickness or injury, allowances for travel and subsistence and payments to craftsmen for tools.

87. The make up of the actual earnings of craftsmen and labourers in the construction industry in 1968 is given in the table below. The basic pay under the working rule agreement rates and the standard 40 hour week is £15 8s 4d for craftsmen and £13 3s 4d for labourers (5s more in London and Liverpool). The table indicates therefore that there is a work-place margin over the basic rates but that this is much less important in affecting earnings than overtime or bonus.

*Composition of Weekly Earnings—Great Britain Construction Industry*

| Item | All Craftsmen | | All Labourers | |
|---|---|---|---|---|
| | £ s d | % | £ s d | % |
| Basic Pay | 16 18 1 | 74·4 | 14 1 11 | 68·3 |
| Total Overtime | 3 2 8 | 13·8 | 3 16 1 | 18·4 |
| P B R Bonus | 2 0 6 | 8·9 | 2 0 5 | 9·8 |
| Other Payments | 0 13 4 | 2·9 | 0 14 5 | 3·5 |
| Total Weekly Earnings | 22 14 7 | 100·0 | 20 12 10 | 100·0 |

88. Table 7 of Appendix C (page 66) compares the average weekly earnings of building craftsmen and labourers and other manual workers in various parts of Great Britain and shows that while for general manual workers, Scotland was a low paid area, building workers earnings were among the highest of any part of Great Britain. Table 8 and the diagram of Appendix C (pages 67 and 68) indicate that this high level of building workers earnings in Scotland has developed only in the last 3 years.

89. Tables 9 and 10 of Appendix C (pages 69 and 70) are extracts from the Statistical Supplement (Cmnd. 3982) to the National Board for Prices and Incomes Report No. 92

"Pay and Conditions in the Building Industry", November 1968 (Cmnd. 3837). This analysis of average earnings levels by region shows a considerable variation. For all craftsmen the difference in total weekly earnings between the highest and the lowest region is more than £5 a week and average hourly earnings range from 8s 9d to 10s 7d. Scotland has the highest level of earnings. In England, London and Merseyside have the highest average weekly earnings (£24 17s 9d). This is not due to the lead of 1½d an hour on standard rates in the W.R.A. but is entirely the result of consistently high overtime and bonus earnings. The lowest earnings are to be found in the South West, where the average for all craftsmen and for each of the five main trades is much lower than in any other region. The reason is clearly due to the very low incidence of variable bonuses. The picture for adult labourers is very similar, with London, Merseyside and Scotland leading and only two other regions exceeding £20 a week. At £24 8s 4d labourers in London are earning at least £2 a week more than the average craftsmen anywhere in England outside London and Merseyside. Conversely at about £20 a week, craftsmen generally in the South West are taking home less pay than the average unskilled labourer throughout Great Britain. Pay is not of course in any way related to productivity. The analysis of average basic rates of craftsmen by region indicates a considerable variation in plus rates, plus rates being arbitrary additions to the standard hourly rate, often as an inducement to attract operatives and paid when no incentive scheme is in operation.

90. The highest plus rate earnings were found in the West Midlands (6½d) and London (5d), the lowest in Merseyside (1d), and Wales, the south west and the north of England (2½d). As to hours of work, London and Scotland, followed by Merseyside and the north west generally work longer hours, with Wales and the south west at the other end of the scale. In London, craftsmen were on average working over 49 hours and adult labourers 52 hours. For the former, overtime earnings (plain time plus premium) amount to over 17% of take home pay and for the latter the proportion is over 23%. For Wales, where overtime averaged around 5 hours, the equivalent proportions are less than 10% and 14%. For craftsmen, Merseyside clearly leads the field although less than half the men are on bonus. The average figure is over £4 6s so additional earnings for a man on bonus work in Liverpool are about £8 12s. Merseyside is followed by Scotland and the North of England, also well above average in terms of both numbers and pay. The South West is distinguished by having only a fifth of its craftsmen on bonus. The range is less extreme for labourers, with London this time leading the field, followed by Merseyside, Scotland and the North.

91. The N.B.P.I. survey of construction earnings was undertaken quite independently of the D.E.P. The regional classification used does not coincide with the Economic Planning Regions used by D.E.P., since areas of particular interest, e.g. Merseyside and London had to be shown individually. Regions of Scotland and Wales are naturally the same in both cases. A particularly interesting point is that since the multi-regional classification is not used by N.B.P.I. any bias in D.E.P. figures, if such exists, should be highlighted. N.B.P.I. census figures in fact reflect the same pattern shown in D.E.P. statistics. Scotland is still the region of highest earnings. Additional information of considerable value to this study is that individual building trades and building foremen are shown separately by region.

92. One of the findings of N.B.P.I. is that the difference in earnings by region does not wholly conform to the pattern which local labour market pressures, measured in isolation by the incidence of unemployment, would create. They refer to earnings levels for all adults being below average in the South West and Wales, whilst some of the highest earnings are to be found in other areas of low labour demand namely Merseyside and Scotland.

93. A similar view is expressed in the "Report of the Committee of Inquiry under Professor E. H. Phelps-Brown into Certain Matters concerning Labour in Building and Civil Engineering" (Cmnd. 3714, July 1968). The subject of the report being labour-only

sub-contracting in the construction industry. This report states—"prevailing unemployment tends both to maintain union membership and inhibit labour-only sub-contracting, while labour shortage does the opposite". Scotland is known to be the most highly unionised region in the construction industry. The incidence of labour-only sub-contracting is extremely low in Scotland.

94. The reason for the high level of earnings in Scotland is of particular interest to this study since a combination of high earnings and the low output already indicated would lead to higher building costs. Generally high earnings in an area are synonymous with labour shortage.

## Labour Supply

95. The claim is made by most contractors that there is an insufficient supply of craftsmen, but this is not confined to any particular region, but is particularly true of those areas of Britain where a high level of activity in construction is taking place. The following table gives a comparison between the Percentage of Building Workers in each Region and the Percentage of the Employed Population.

| REGION | North N. East N. West % | N. and E. Midland % | London and S. East % | South and West % | Scotland % | Wales % |
|---|---|---|---|---|---|---|
| All Building Workers G.B. 1963 . . | 23 | 21 | 18 | 20 | 11 | 7 |
| All Workers G.B. 1963 . . | 27 | 24 | 22 | 12 | 10 | 5 |

Source: Labour Mobility in Great Britain 1953–1963 H.M.S.O. 1966

If it is assumed that the amount of building generated is determined by working population these figures would suggest that the first three regions are undermanned by building workers to the extent of 11% and the remaining regions correspondingly overmanned, principally the South and West, while according to these crude figures Scotland has more than its share of building workers.

96. The point made above is stressed because figures of total unemployed and jobs available are only a general indication of the level of employment as far as the contractor is concerned. An adequate supply of operatives does not correspond with a surplus registered as unemployed. As far as the contractor is concerned trade status does not in itself guarantee that the prospective employee will be adequate for the job envisaged. In fact examples have been noted where certain individuals are available for work but in the opinion of the contractors "are not worth employing", in other words unemployable in a situation of unfilled vacancies. Clearly as far as the contractor is concerned, adequate labour supply would correspond with having an available surplus of acceptable operatives. The conditions which meet this requirement would be a situation where numbers of operatives of above average ability were unemployed and available for work. This situation does not apparently exist in any areas of Britain where extensive private housebuilding is carried out.

97. The housebuilding industries of Scotland and England are well known to be markedly different in the respective proportions of local authority housing to private enterprise housing. However, the yearly production of houses, irrespective of ownership, is similar when considering number of houses built per 1,000 population, in either country. In addition, many of the larger Scottish contractors build both in the local authority and private sectors. Up to a point there is more opportunity of interchange

for operatives in Scotland between the different sectors, because of the work spectra of the firms. It is fair to assume then, that statistics covering employment levels for the construction industry as a whole are representative of those operatives normally engaged in housebuilding.

98. Data based on D.E.P. statistics indicate levels of unemployment for the Economic Planning Regions of Britain. It is clear from these data that the demand for labour in Scotland is no less than that for other regions in Britain, and in fact it can be shown that Scotland is a region of high labour demand compared with South West, Yorks and Humber, North Western, Northern and Welsh regions. (See Table 6 on page 65).

99. This disagrees with the findings of both the Phelps-Brown Report (Cmnd. 3714, July 1968) and the N.B.P.I. Report No. 92 Pay and Conditions in the Building Industry (Cmnd. 3837). Both these reports refer to high unemployment and low demand for construction labour in Scotland. This apparent contradiction can be explained if the level of unemployment is related to total unemployed in construction, without an analysis of the occupations of those unemployed. But this is not thought to be a realistic assessment of the situation, since the requirement for craftsmen in private housebuilding compared with labourers is in the proportion of 2.1. When an analysis of the unemployed by occupation is made, it is found that about 90% of the unemployed construction workers are labourers. (See Table 6 on page 65.) The effect of a larger number of unskilled workers being unemployed in Scotland would be that there is a wider choice available and it should therefore include a higher proportion of the more suitable workers. The situation regarding skilled men is, it must be emphasised, one of considerable shortage compared with many other regions.

100. A report entitled "Manpower in the Scottish Construction Industry" published by the University of Glasgow, Department of Social and Economic Research in October 1965 stated "there have been no general or persistent shortages of building labourers over the past 5 years. There appear to be continuing and widespread shortages of joiners and local shortages of bricklayers". A further report, "Development and Growth in Scotland 1963–64" (Cmnd. 2440), stated "All sections of the industry are busy throughout the country and there is evidence that in the eastern half of Scotland they are extended to near maximum capacity", and "Local shortages of craftsmen had delayed work on certain projects". This demand for craftsmen goes some way to explain the high earnings level in Scotland, indicated previously. Another indication of labour shortage could be the higher level of overtime working in Scotland, (see Table 11, page 71).

101. Professor Bowley in the "British Building Industry, Four Studies in Response and Resistance to Change" makes several references to variations in the type of housing regarded as appropriate in particular regions. References to Scotland include "In 1925 an additional subsidy was offered for 4,000 non-traditional houses, economical in skilled site labour". "The Scottish Special Housing Association was established in 1937 to build houses by non-traditional labour saving means." All available evidence indicates a higher proportion of non-traditional houses in the public sector of the Scottish region, underlining an attempt to achieve economies particularly in labour. For various reasons, the private sector has never, irrespective of region, produced or had a ready market for non-traditional houses. On the evidence from the public sector one can conclude that the producer in the private sector in Scotland vis-a-vis the other regions is at a particular disadvantage with respect to supply of skilled labour. The shortage of building craftsmen in Scotland would on the evidence available appear to be a problem by no means of recent origin. The labour supply position between 1939 and 1969 indicates that unemployment of building craftsmen was no higher in Scotland than other regions. At the present time one can say that the rate of demand for craftsmen is similar to other areas which experience a labour shortage namely London, South East and Midland regions.

102 The fact that this shortage of craftsmen in Scotland is not due to a crude shortage of numbers per 1000 population leads to the assumption that the labour force is working

at a lower level of output thus requiring more craftsmen to do a given volume of work. If productivity were to increase only marginally there could well be a labour surplus, unless reduced prices increased demand sufficiently to take up such a surplus.

103. In those regions of England where labour shortages occur, the ability of a man to undertake a craftsman's work is sufficient to enable him to be employed on that craft and since 1947 there has been considerable dilution of "time served" craftsmen by others who have become bricklayers, plasterers, etc., through experience as labourers, improvers or mates. The labour market in England is therefore in a position to adjust to particular levels of demand through the presence of these marginal craftsmen. By comparison in the industrial belt of Scotland it is necessary on most contracts for men to be members of an appropriate trade union, and union membership is only available to "time served" craftsmen. This particular point is made several times in the case studies undertaken by the National Board for Prices and Incomes. In this situation, shortages of labour are difficult to overcome hence the higher earnings and more overtime worked in Scotland, increased overtime being an inducement offered to prospective employees rather than any requirement of a particular contract. Overtime is a particularly expensive procedure since it includes the overtime premium which is non-productive. That more overtime is worked in Scotland is shown in Tables 8 to 11.

## Pattern of Firms and Scale of Operations

104. A survey of organisational pattern and scale of operations suggests that Scottish private housebuilders' organisations are on average twice as large as those in England (based on number of dwellings produced per annum) and in addition, the sites they develop contain twice as many dwellings. A complete analysis of this particular survey together with other information indicated that in Scotland ten builders together produce 65%–75% of the private houses built per year. And two out of these ten builders have in the past produced between them up to one-third of the houses built in any one year. Also, one firm built almost one-quarter of the entire annual output during 1967 and 1968. By contrast, figures for Great Britain included in Table 13 (page 73) show that for Britain as a whole, private housebuilding is dominated by small firms, 56% of private housing output being produced by firms with less than 60 men. P.I.B. Report No. 92 confirms this. The implications of this marked difference in organisational pattern between the two countries are of considerable significance in any study of comparative costs.

105. The large-scale operations typical of this small group of large housebuilders in Scotland do not necessarily reduce overall production costs, for in low-rise private housebuilding economic operations depend on sales keeping pace with production and this has no relationship to overall size of site or size of producer. Available evidence suggests that the unit costs of large private housebuilders are no different from those of smaller housebuilders. This is confirmed by the Phelps-Brown Report and by recent Building Research Station studies indicating that small builders on small sites can match the efficiency of large builders on large sites. It is impossible to ignore the suggestion that in Scotland the predominance of a small number of large private housebuilding organisations is bound to be associated with a situation where the incidence of competition is slight compared with operations in England. Many Scottish builders have near monopolies in their own area of activity and in this situation they are more prone to allow costs to rise and in turn pass on the increased costs to the consumer. There is also the inescapable economic maxim that selling price is determined by level of demand as much as cost plus profit. The fact that house prices in Scotland have risen (according to the published figures prepared by the Co-operative Permanent Building Society) at a much greater rate than in other parts of Britain cannot be entirely accidental. When this survey revealed the lack of small housebuilders in Scotland further studies were made to determine if any special difficulties prevent small housebuilding firms to starting up in Scotland, but apparently the facilities available are similar to those in England.

## Labour-Only Sub-Contracting

106. Under a labour-only sub-contract the main contractor himself provides the materials and most of the equipment required and pays the sub-contractor for doing the work. The sub-contract is for "labour only" and this distinguishes it from the other form of sub-contract, i.e. "supply and fix", in which the sub-contractor himself provides labour, materials and possibly some or all of the mechanical and non-mechanical plant necessary to complete his particular contract. Generally, the labour-only sub-contractor provides only hand tools but in the case of the bricklayer he may be responsible for erecting his own scaffolding. The payment fixed in the sub-contract may take the form of a lump sum for a particular task or may be a form of piecework where an agreed rate per unit of work is negotiated. The agreed unit of work in house-building is not normally in accordance with the Standard Method of Measurement. It may, for example, be simply an agreed sum of money per thousand bricks laid. The important principle to be recognised in labour-only sub-contracting is that any payment made is directly related to volume of work completed and the main contractor is absolved of any responsibility for statutory payments, these being the responsibility of the individual labour-only sub-contractor.

107. Within this broad definition labour-only sub-contracting may cover a variety of arrangements embracing established firms operating as limited liability companies with a fixed place of business, or gangs of men under leaders or labour masters. These gangs may have a settled and continuing existence under a responsible leader who may himself work with the gang at least part of the time but who also takes on the sub-contract himself, pays the gang and bears the proper responsibilities as an employer for his men, stamping National Insurance cards, deducting P.A.Y.E. etc. At the lower end of the scale, labour-only sub-contracting organisations consist of gangs, nomadic in character, constantly changing in composition, with all members functioning as self-employed persons.

108. Labour-only sub-contracting is most commonly encountered as a method of employment in South-East England and the Midlands. These are regions which have already been shown to be associated with high productivity. Both regions have experienced problems of labour shortages and so has Scotland. The incidence of labour-only sub-contracting in the northern regions of England is low but labour shortages are by no means as acute as in Scotland. A full and detailed report on labour-only sub-contracting was published in July 1968[1].

The conclusions of the report were that *the discontinuation of labour-only sub-contracting would be on balance disadvantageous to the industry*. The findings of the Committee met with the joint approval of both employers' and unions' federations.

109. It seems clear that labour-only sub-contracting of an unregulated kind reduces labour costs and since this form of employment is rarely found in Scotland, English private house-builders gain a cost advantage. To illustrate one possible cost advantage—Selective Employment Tax (SET) is payable by the employer at the rate of 37s 6d per week for directly employed persons. Self-employed persons are not required to pay this tax. Assuming 2,000 man hours per dwelling (the national average) this represents 50 weeks at a 40 hour week. The extra cost of directly employing men, attributable to SET alone, is 50 weeks × 37s 6d, i.e. extra cost of £93 15s. This calculation ignores other contributions and levies evaded in most instances of labour-only sub-contracting.

## Climate

110. Reduced productivity due to inclement weather can be divided into five categories.

1. When operatives are prevented from working by cold or wet conditions, but are being paid by the contractor in accordance with National Working Rules.

---

[1] "Report of the Committee of Inquiry under Professor E. H. Phelps-Brown into certain matters concerning Labour in Building and Civil Engineering" H.M.S.O. Cmnd. 3714.

2. Loss of output caused by operatives working in bad weather.
3. Additional time spent on rectification when damage has been caused by frost, rain or wind.
4. Lost time when men are made redundant through exceptionally severe weather conditions or when they fail to report for work because of the weather.
5. Reduced daylight during the winter months.

The last two categories are different because
(a) they are normally confined to the winter months;
(b) lost man hours are not paid for directly by the contractor.

Costs are also incurred indirectly by increased overheads and delayed completion times.

111. A Building Research Station Report published in 1966 "Weather Conditions and Productivity" showed that the losses expressed as percentages of the total manhours per traditional house ranged from 0·7 to 3·4% for the man hours paid for by the contractor, and from 1·2 to 4·8% for the remaining man hours. Loss of man hours paid for by the contractors amounted to 38 man hours per house. A survey of bad weather losses on Scottish sites is included in another B.R.S. Report published in 1965 "Survey of Winter Working Practices in Scotland". The report demonstrated that in Scotland over a twelve month period, time lost through wet weather and wind can total as much as that lost in cold weather.

112. The scale of disruption in building has little reference to the total amount of rainfall but is closely related to its frequency. Kinloss and Wick have similar annual rainfalls, approximately 30 inches per year, but the pattern of rainfall is quite different. It rains at the critical rate nearly twice as often in Wick and consequently there would be twice the disruption of outdoor construction work. Similarly both Edinburgh and London have about 27 inches of rain per year, but the incidence of critical rainfall is higher in Edinburgh, 330 hours per year, compared with London, 273 hours per year. It seems clear from this that the builder working in Scotland is at a considerable disadvantage compared with his counterpart in England.

113. Winters in Scotland are no more severe than they are in the South of England. Temperatures in the winter are comparable with London and other places in South-East England, but because of the high latitude and the onset of cold easterly winds from the North Sea, the rise of temperature at the end of winter is much slower than it is in the South. Consequently the winters last longer in Scotland, and spring is later and cooler than in the South. In summer and early autumn the effect of latitude on the heat received from the sun is the dominant factor, and temperatures in Scotland are several degrees lower than in the South of England.

MEAN DAILY TEMPERATURE °F (1931–1960)

| *Location* | *December* | *January* | *February* |
|---|---|---|---|
| Wick | 40·3 | 38·0 | 38·3 |
| Glasgow | 40·0 | 37·6 | 39·0 |
| Edinburgh | 39·5 | 36·9 | 38·1 |
| Manchester | 40·1 | 38·1 | 38·7 |
| Birmingham | 39·9 | 37·8 | 38·3 |
| London | 40·8 | 38·8 | 39·7 |

[Data have been plotted demonstrating that although the mean temperatures in Scotland and England are similar the pattern of temperature is somewhat different, the temperatures in Scotland tending to fall to the critical levels more frequently.]

114. Since the introduction of British Standard Time operatives have had the start of the day delayed to 9 a.m., owing to the lack of daylight in the early morning. While the introduction of B.S.T. has not reduced the total daylight available there is evidence that it has effectively reduced output because the highest production is achieved during the morning hours and if the length of morning is reduced the loss of production is not made

up by adding on time at the end of the day. Table 12 on page 72 illustrates the total daylight available for selected areas of Britain. There is significant difference when comparing the two extremes of Wick and Plymouth. A comparison of the Scottish Central Belt, average latitude 56° N, with an average latitude for England, say, of 52N°, which is the mean of the figures for Birmingham and London shown in the table, is thought to be a better indication of the effect on the private housebuilding sector.

115. During the winter, builders work 7½ or 8 hour days in 5½ or 5 day weeks. To do this and take ½ hour for lunch 8½ hours of usable daylight are required. But in the industrial belt of Scotland there are 9 winter weeks when, less than these hours are available. During the darkest 3 weeks of the year there are only 7½ hours per day. In addition to the total daylight available there is Civil Twilight, which is the threshold of worthwhile daylight for outside work. During clear bright days the whole of twilight is available for outside work but under overcast conditions the light may not be sufficient. An average therefore of half the available twilight is often taken, as the addition to be made to the hours of daylight, to give a fair indication of usable daily light during the winter period for those working in reasonably unobstructed areas outside the building. The critical difference in total light available between Scotland and England is confined to the months of November, December and January. Allowing for the fact that twilight is available for longer periods in Scotland the difference between Latitude 56° N and Latitude 52° N is about an average of ½ hour per working day in November and January. In December the difference is an average of ¾ hour. On the basis of 20 working days per month which allows for National holidays, England has an additional 35 hours of usable light during the critical winter months.

116. If the total of working man hours per year for one house is approximately 2,000, and the additional loss of light during the winter months in Scotland compared with England is 35 hours, this could represent around £26 per house extra, provided of course that the house was built during a period in the year which embraced the winter. Under normal conditions a housebuilder would try to keep to a six month cycle of operation for the construction of a house. He would also try to build more houses in a period which did not include the winter. Consequently it would seem reasonable to take rather less than half the £26 (say £12) which has been shown to represent the cost of the 35 daylight hours which Scottish builders lose during the winter.

117. The B.R.S. study showed that the average loss attributable to bad weather and paid for by the contractor amounted to 38 manhours per house, equivalent to about £34 per house at current earnings levels. This represented the average loss on five sites in England. Differences in temperatures and wind between Scotland and England are unlikely to cause increased stoppage of work in traditional house-building. It has been stated (paragraph 112) that rainfall at the critical rate occurs more frequently in Scotland than in England. The increased frequency is about 40%. It is reasonable to assume that this would represent the extra cost attributable to the Scottish climate.

$$\text{e.g. } £34 \times \frac{140}{100} = £48$$

Increased cost in Scotland due to rainfall is therefore

$$£48 - £34 = £14$$

For excessive rainfall and daylight loss the cost additional on a single house is £14 plus £12 = £26.

## Trade Practices

118. From site studies in both countries and many references to architects, builders, building-inspectors, craft teachers, etc., who had gained a really significant amount of experience in both countries, it was evident that certain marked differences exist in trade practices. These differences show up most in scaffolding and roofing techniques, material

sizes and quality of work. In the absence of a work study programme it was rarely possible to quantify positively in terms of cost what advantages or otherwise resulted from the various differences in craft practice that were investigated. This was particularly so in relation to quality of craftsmanship. The National House-Builders' Registration Council are very conscious of this and have tried with little success to codify requirements for quality, such as a given tolerance for a well fitting door or the uprightness of a wall or level of a ceiling. When a British Standards Committee drew up B.S.116 and defined standards for quality of craftsmanship in carpenter and joinery work the Committee found itself unable to formulate a precise specification for surface finish that would be sensible and generally acceptable by the industry.

119. There are certain historical reasons for Scottish builders and craftsmen doing some things differently. Until 30 years or so ago most new building operations were conducted on the basis of separate trades contracts. The entrepreneur or architect engaged in a series of completely separate contracts with the various tradesmen required to do the job. The individual contractors had little or no contact with each other—they just came and went at the bidding of the entrepreneur or architect, who was responsible for the coordination of the entire project.

120. Over the past 30 years and particularly since the forthright criticisms in the McEwan Younger Working Party Report, 1964, the concept of a main contractor responsible for the entire process of construction has gradually become acceptable in Scotland. But traditional ways appear still to persist and this, to a considerable extent is probably the cause of the continuance of certain differences in Scottish trade practice.

## Scaffolding

121. In England, as soon as the foundations are completed, an external scaffold is erected by the main contractor. Its initial purpose is to provide a platform from which bricklayers can work properly; that is on the outside of the external walls, from the corners of which they set their lines and plumbings. From it also the bricklayers build in door frames, window sills and window frames as the brickwork proceeds upwards. At the correct level, sills are laid, upon which the various frames are erected and plumbed. The brickwork is then built tight against them. Throughout the progress of the job the scaffolding remains, and in due course it provides a safe platform at different levels from which other trades can work. The joiner fixes the roof members and eaves construction from the scaffold also, and from it the roofer reaches his area of work. The plasterer or slater renders the walls from each scaffold lift and the plumber uses the top lift of the scaffold to fix the eaves gutter.

122. In Scotland, the tendency is for each trade to see to its own scaffolding needs in complete isolation from other trades. This gives rise to trade practices which differ so markedly from English practice (these are discussed later under the sections on the respective crafts). Whatever scaffolding is erected by each trade, it is usually dismantled immediately that particular trade has finished with it. Usually the scaffolding method and sequence on Scottish low-rise housing consists of the bricklayer working from trestles and planks for the first lift, then internally from the first floor joists—again by means of trestles and planks—always working from the inside of the building, laying his bricks overhand. The joiner positions his first floor joists from an internal trestle scaffold or ladder and erects the roof frame from a trestle scaffold erected first on the floor joists, then on the ceiling joists. If the eaves construction involves a tilting fillet or fascia board and soffit, the Scottish joiner does this either by leaning out over the wall head or from external ladders. Without the convenience of an external scaffold the joiner's movements about his work are manifestly awkward and tiring and his mobility when fixing the roof members is restricted to the confines of the brickwork shell at wall plate level. The plumber fixes his eaves gutter by leaning out from the inside or from a ladder, the slater and tiler obtains a foothold on the roof initially by ladder until the lower battens are

fixed. Finally, any external rendering is applied from an individual scaffold of a very temporary nature.

123. These various forms of access allowing each trade to achieve its own individual contribution to the construction of a two-storey house are usually precarious if not downright dangerous. From observations made it seems that the various trades manage, as they always have done, to do their work reasonably well. In fact, the craftsman responsible for applying rendering or roughcast to a two-storey wall prefers his somewhat precarious "pin and pole" method of access because his rendering or roughcasting is not held up for the dismantling of a substantial scaffold structure on English lines and, therefore, does not give rise to the unsightly "joins" that can occur when there is a hiatus in rendering or roughcasting operations.

124. While it is not possible, in general terms, to criticise on a cost basis the Scottish trade practice regarding scaffolding—indeed a thorough work study investigation might prove it to be cost-saving in comparison with the English external scaffold—there is the certainty that these traditional scaffolding methods frequently fall short of the requirements of the Construction (Working Places) Regulations, 1966, particularly where these regulations require that when men work on a roof inclined at more than 30 degrees they must be protected from falling over the edge of the roof by a barrier at eaves level or a working platform below the eaves. The attitude of H.M. Inspectorate to contraventions of regulations is understandably governed by their need to concentrate on the prevention of accidents rather than the enforcement of the regulations themselves. Since two-storey traditional housing has a very low incidence of accidents compared with other sections of the construction industry in both Scotland and England, and past records do not indicate a higher rate of accidents on private housing in Scotland, then the regulations, unless they result in accidents which require investigation, tend to be "honoured in the breach".

125. Calculation of the additional cost of providing an external scaffolding measured against the cost of an internal arrangement is a complex operation but a figure of £20 per house would tend to represent what a builder saves on the cost of a house by not providing an external scaffold. This cost would be offset by rectification of poor brickwork craftsmanship and reduced productivity consequent on difficult access to work.

## Window Installation

126. English housebuilders almost invariably build in door and window frames as construction progresses. Scottish housebuilders simply leave openings in the walls, the window and door frames being installed sometime afterwards—usually when the shell and roof have been completed. This is a traditional technique which appears to be founded on the old single trade contracting system where the mason or bricklayer came on to the site, built the shell and went away. The joiner then came on to the scene, laid all floor joists, put the roof on and installed the windows. This pattern of operations appears to have persisted over the years even in the private housebuilding sector where there is a stronger tendency to an "all trades" pattern. The one really significant advantage that can be claimed for the practice is that window frames installed after the shell is completed are less likely to be damaged by falling objects, or by the passage of barrows, buckets and workmen through framed openings; or even by the use of a window frame transom bar as a support for a scaffold component.

127. The rectification of damage to a wood window or door frame can be expensive—indeed the rectification of a distorted metal window or door frame may be impossible and could involve replacement. Set against this the practice of installing frames after the shell has been built can also be expensive for it involves three separate processes against the single operation of building in as the work progresses. In these processes the bricklayer sets out the width of the opening allowing an appropriate tolerance and then builds two stop-ends, plumbing at each course to ensure uprightness. Usually he has to leave

recesses to accommodate the end overhang of the window sill, he also has to leave holes to receive fixing lugs. Later the joiner (possibly the bricklayer if there is no danger of a demarcation dispute) installs the window or door frame. He may find that the frame does not fit the opening which has been left for it and he may have to insert temporary packings if the frame is slack, or axe the frame down if tight. (Site observations confirmed this, also that window frames were frequently forced into restricted openings resulting in distorted and damaged components). The final process is the building or bedding of a sill of concrete or other suitable material so that it fits snugly up to the critical part of the base of the window frame. This is done in the restricted space which has been left between it and the extremity of the opening. There is also the building in of lugs where they are used to fix the frame to the wall, and finally there may be another bricklayer operation requiring the insertion and bedding of a series of thin packing pieces around the frame together with the consequent making good by pointing. Builders have stated that the use of an excessive thickness of plaster on the inside of openings in order to make good has led to excessive cracking of the plaster and costly rectification.

128. Builders and architects have estimated the cost of this delayed process of building in window and door frames at a minimum of £1 10s for each frame which could result in a total of around £12 a house. (Observations on sites visited late 1969 towards the end of the research programme indicated that some Scottish firms had already changed over to building in windows or were trying to induce foremen and craftsmen to do so.)

## Roof Tiling and External Wall Finishing

129. Traditionally in Scotland the external rough casting which is employed on most new housing is done by a trade not found in England—the tiler/roughcaster. In England where the incidence of external rendering is far less, the operation is the responsibility of the plastering trade. The Scottish combination of rough casting and roof tiling in one trade is quite logical, since the process of rough casting and tiling takes place at about the same time during construction of a building, i.e. after the shell and roof structure are complete. Apart from the existence in Scotland of this specialist trade there is also an interesting variation in the responsibility for doing the tiling work. In England, roof tiling on new housing is carried out by specialist roofing contractors who supply and fix the materials. In Scotland, more than half the roofing is done in a similar manner, but the remainder is carried out by employees of the main contractor. Since the tiler/roughcaster has to be employed in any case to render the house then it would seem appropriate for him to undertake this task, rather than employ a further specialist. (Roof tiling is dealt with under Materials, Chapter 3).

## General Carpentry and Joinery Practices

130. There is a tendency in Scotland towards thicker sections in timber and joinery while the use of roof sarking is traditional. The historical reasons underlying these markedly different practices are a little obscure but it is considered that the original functions of sarking in a Scottish sense were (1) to provide a continuous flat surface on which to nail the slates, (2) to brace the roof frame, (3) to provide additional support for Scottish produced slates (mainly Ballachulish) which are heavier than most encountered in England, (4) to seal the roof space, as well as possible, from the entry of wind and in particular wind-driven snow. Thus, sarking by Scottish standards consists of stout, butt-edged rough boarding nailed to the roof rafters, with a covering of bituminous felt laid over it. There seems to be a growing tendency for an economic compromise with this traditional sarking requirement and many builders are using various types of insulation board instead of wood boarding. In England there never has been a tradition of sarking in any but the most expensive forms of building. The English traditional method is to nail slates or "hang" and nail tiles on wood battens fixed horizontally to the roof rafters. Until a short time ago, there was no sarking used in roof construction on English private housing, but the trend now is towards the technique of draping lapped bituminous felt horizontally over the rafters.

131. Now that the supply of Scottish slates is virtually worked out, roofing tiles (mostly of concrete) are almost invariably the accepted roof covering in private housing, therefore the Scottish roofer cannot nail tiles direct to boarded sarking because the tiles incorporate projecting "nibs" (for the purpose of hanging the tiles on battens) which prevent this. The effect of this is that the boarded sarking is still used with its covering of bituminous felt, and horizontal battens are nailed on this surface to receive tiles. Unfortunately, this creates horizontal ledges on which penetrating moisture can collect and cause rot, so the only really effective technique is what is termed counter battening (battens parallel to the roof rafters fixed at intervals under the horizontal battens). Full counterbattening—where sarking is employed—is now a Code of Practice and N.H.B.R.C. requirement. A counter-battened, fully sarked roof represents a first class standard of construction but it makes for a very expensive roof. The Scottish Building Regulations do not in fact require sarking but most Scottish masters of works strongly favour it and Scottish private housebuilders normally provide it because it is part of the accepted traditional form of construction in Scottish roofing.

132. Ground floor construction in Scottish low-rise housing has always tended to consist of suspended timber floor joists with a ventilated space between the underside of the joists and the solum. (The term solum is peculiarly Scottish and has no precise equivalent in English terminology—it refers to the surface of whatever material is spread over the earth below the floor). Solid ground floor construction is favoured by English housebuilders. This consists of hardcore and concrete resting solidly on the earth together with an appropriate damp-proofing arrangement. The surface of the concrete is usually screeded and covered with p.v.c. tiles, while the wood joisted suspended floor preferred in Scotland has a surface of tongued and grooved floorboards. There are distinct advantages and disadvantages associated with both types of floor construction and the relative costs vary directly according to the nature and slope of the site. In general the suspended wood joist floor is more costly but is favoured by the Scottish purchaser. (The additional cost is indicated in paragraph 74). A further point of difference is that when the English builder constructs a wood joisted floor the floorboard covering is cramped into position, seven or so boards at a time, and then each board is fixed to the joists by nails piercing through the upper surface of the board. The Scottish builder and the Scottish housewife apparently find this practice abhorrent on account of the many unsightly nailheads or punched holes. The Scottish method, which is much more costly, is to fix one board at a time with nails driven through the tongued edge of the board. This practice is known in England as "secret nailing" and is regarded in the trade as a high class practice reserved for expensive work.

133. Apart from these significant differences between English and Scottish roofing and flooring techniques there are many other rather less significant variations in practice. Roof rafters tend to be deeper in section and the English "purlin" method of supporting rafter spars is rarely used by the traditionally inclined Scottish builder who prefers to support rafters individually and more positively by struts and collars. The thickness of floorboards, door standards, partition studs and joinery finishes all tend to be a little more where Scottish traditional standards prevail. But against all these differences must be set the effect of the "levelling down" process in the private housebuilding sector which tends to diminish the influence of Scottish traditional standards.

134. In the context of any general review of craft work on both sides of the Border, private housebuilding has a marked tendency to level or iron out differences in quality of craftsmanship. This is largely due to the quite substantial private housebuilding operations now being carried on in Scotland by builders originating from England. The evidence of impartial observers indicated that a "levelling down" process takes place when the Scottish joiner finds himself working to English joinery standards. He has to accustom himself to diminished component sizes in roofs, floors and partitions, slender door casings, door stop, door facings and skirtings. (This was brought out many times during the research in elemental cost analyses made of similar houses built on either side of the

Border). There are many cases where the Scottish tradition is for heavier and stronger timber construction and more solid wood finishings, and while traditions are not obligatory in a building regulation sense, there seems little reason to doubt that Scottish Masters of Works and those builders of Scottish origin are still inclined to build to Scottish traditional standards even when they go further than the strict requirements of statutory regulations. This is particularly so in the carpentry and joinery work found in the average house built by a Scottish builder operating only in Scotland. The cost of all this is extremely difficult to measure and it is even more difficult to apportion the increased cost to Scottish private houses on a general basis, because English firms building private houses in Scotland do not always feel bound by another country's traditional practice and consequently tend to build strictly to the requirements of the Scottish Building Regulations, and nothing more. A further complication arises when firms of Scottish origin feel that if they are to stay in business in what they describe as a fiercely competitive market then they must of necessity abandon the high tradition of their forefathers, and thus be associated with the "levelling down" process.

## Mechanical Plant

135. A study in considerable depth was made of the use of mechanical plant in the private sector of building on either side of the Border. It soon became evident that contractors do not normally hold detailed information on plant input, utilisation and costs, also the amount of information on plant obtainable from government departments, trade associations, etc., is limited and not sufficiently detailed to identify plant used in the private housing sector. The investigation into the factors which affected the costs and economics of operating plant indicated that any differences in purchase price of an item of plant sold in Scotland and England are due to the method of sales and distribution. Small items of plant cost the same in both countries. Plant sold through appointed area distributors showed marginal differences in price depending on the distribution. Plant sold through a manufacturer's direct sales organisation is affected by transport costs from the place of manufacture which is usually the London area or the Midlands. Any eventual sale depends very much on the bargaining expertise of the salesman or buyer, also the supply of and demand for equipment.

136. The most rewarding aspect of this part of the research was concerned with the use of mechanical hoists on two-storey housing. It was found that in Scotland mobile hoists were being used increasingly on two-storey work. In England, apart from the extreme north, hoists are rarely used on two-storey housing of traditional construction. Owing to the possible implications regarding building cost, further enquiries were made to determine the reasons for this difference in practice which appeared to be a national characteristic. The following observations are based on site visits and on comment made by housebuilders working in both countries:

*Scotland*

1. Hoists are used in Scotland because there is a shortage of labourers prepared to raise bricks manually.
2. A lower incidence of hoists in West Scotland was noticed and appeared to be a reflection of the less acute labour position. On large sites visited in the Greenock area bricks were lifted by three distinct methods.
   (a) Mechanical hoists
   (b) Manually by hod carriers
   (c) Manually using wheelbarrows and battens.
   The method employed depended on the contour of the site and the design of the building.
3. The use of a mechanical hoist is more beneficial when no external scaffolding is provided.

*England*

1. In high wage regions, labour-only sub-contracting is used extensively and the main contractor supplies only the absolute minimum of plant.
2. In low wage regions labour is readily available to lift the bricks.
3. The use of external scaffold reduces the advantages of mechanical hoisting.
4. Mechanical hoists are expensive to buy and maintain, and can cause serious accidents.
5. Mechanical hoisting on two-storey housing is uneconomic since two men are required to operate the hoist, one at ground level and another on the working platform.

137. The mechanical hoist costs about £8 a week in hire charges but the ratio of bricklayers' labourers to bricklayers is not necessarily reduced if a hoist is employed. In fact, on the evidence made available from case study material, the ratio of labourers to bricklayers in bricklaying squads is usually higher in Scotland than in England irrespective of whether a hoist is used or not. If a mechanical hoist is used in the erection of a two-storey semi-detached house, costs will be increased by three weeks' hire for two houses, i.e. £12.

## Chimney Sweeping

138. Although the Scottish traditional method of sweeping chimneys may seem somewhat removed from housebuilding practices, it largely accounts for the inclusion of certain requirements in the Scottish Building Regulations; requirements which are absent from the English Regulations and which may involve extra cost in the construction of a house and in subsequent repairs. In Scotland the sweeping of a chimney flue involves a man at the top and one at the bottom; in England the operation is simply from the bottom upwards, involving only one man in the entire operation. In the Scottish operation one of the workmen gains access to the roof through a ceiling hatch and special roof hatch (both provided for him at some additional cost by statutory regulations). He then makes his way as best he can without roof crawlers, etc., to the chimney. If the top of the chimney is over 6 ft vertically from the nearest point at which the sweep can approach it, there is another regulation providing for a permanent metal ladder or other suitable means of access by which the sweep can climb to the top of the chimney, and insert his cleaning equipment which consists of a heavy metal ball at the end of a long rope. The ball goes down the flue and when it appears at the correct fireplace aperture below, the second workman fastens a flue brush to the rope then his workmate at the top, standing precariously astride the chimney, completes the cleaning of the flue by a pull-through operation. It is difficult to understand why this sweeping operation is performed in an upwards direction when clearly it would be much easier and so much safer if the effort was applied in a downwards direction. In this curious Scottish sweeping technique, roof slates and tiles are frequently damaged by passage over the roof and certain internal flue partitions are also damaged by the downward progress of the heavy locating metal ball. Added to this the roof operation is precarious and downright dangerous, as safety statistics show. The English method of sweeping a flue in a low-rise building is simply for one man to force a brush up the flue on extensible rods. In both English and Scottish methods the soot is collected at the fireplace opening and a protective covering sheet is stretched over the opening.

139. There are historical reasons for this rather odd and expensive procedure in Scotland. In the 19th Century most Scottish buildings were of the tenement type, rarely less than four-storeys in height. Sweeping with brush and rods from the bottom upwards was (and still is) impracticable owing to the sheer weight of the rods. In England the overall spread of low-rise houses was responsible for the traditional acceptance of the simpler operation. There are still large stocks of high tenement property in Scotland for which the old method is justified. But there seems little merit in building regulations

requiring expensive fitments in two or three-storey houses which only serve to perpetuate an inappropriate system of chimney cleaning—a system which of itself is costly to the client and dangerous to the workmen.

## Brickwork

140. There is in Scotland, an indisputable tradition of fine masonry. There is no comparable tradition in brickwork, for compared with England the trade of bricklayer in Scotland is relatively new. In contrast with the great heritage based on the early resources of Scottish natural stone the resources in Scotland of suitable clay for facing bricks are extremely slender. There is clay of a sort overlying the coal measures in Scotland which can be made up into a common brick which by English Fletton brick standards is heavy, irregular in shape and inconsistent in many other characteristics. This tradition of fine masonry, together with the shortage of suitable clay to make an economically viable supply of facing bricks, and the apparent inability to produce a common brick to compare with the English product has created a vicious circle in which revolve the various segments: (1) the problem of obtaining suitable bricks cheaply; (2) the low standard of brickwork craftmanship; (3) the architect who will not specify facing bricks because of reasons (1) and (2); and finally (4) the traditional technique of internal access to building work which forces the Scottish bricklayer to work overhand when he is building an external wall (clearly a technique of working that is ill suited to the precise standards of bricklaying and quality of pointing demanded in facing brickwork).

141. These factors, in particular the scarcity of competitively priced facing bricks and the irregular shape of most common bricks, contribute considerably to the extremely low standard of brickwork craftsmanship in Scotland. Moreover, the knowledge that the external and internal faces of the walls are to be covered up by plaster or roughcast tends to inhibit pride of craftsmanship and it is a common occurrence where supervision is lax for Scottish bricklayers to raise the line anything from three to seven courses and simply guess the extent of plumbness and level between these limits. The consequences of all this is that the basic shell of the house is frequently out of alignment, out of level and out of plumb, thus affecting every trade which follows. Costly rectification may include axing down or packing out windows or door standards to fit untrue openings, or packing up floor joists to suit uneven brick courses, or applying plaster or rendering over one inch thick to cover up serious errors in alignment. It is impossible to measure with any degree of accuracy the cost of rectification of poor quality brickwork, but whatever the quality there is little reason to doubt that Scottish brickwork costs more through rectification than comparable work in England.

## Plumbing and Plastering

142. Practices in these trades differ only marginally in private housebuilding. Quality of craftsmanship is considered to be rather higher in standard than in the comparable crafts in England.

CHAPTER 5

# Conclusions

### House Prices

143. Clearly if Scottish private house prices are indeed higher than those in England it was essential at the outset to establish a reliable and reasonably close estimate of the extent of the difference in price. Consequently this study was comprehensively based on nearly, 1,000 housing estates representative of all areas. The prices are current for November 1969 and apply to the most popular house type—the semi-detached, two-storey, three bedroom house. Regional price variations were found to be very substantial —amounting in the extreme case to £1,632. In Scotland the maximum regional variation was less dramatic—amounting to £616.

144. The most realistic and statistically acceptable price variation between Scotland and England was shown to be £717. This represents a significant additional sum which Scottish house purchasers must pay in the average case, but it is much less than the amounts which are freely quoted in many quarters—amounts ranging from £1,000 to £2,000 or more. It is accepted that average figures inevitably conceal the exceptional cases, where for example someone leaves a house in Yorkshire which cost £4,100 and has to pay £5,500 for what is believed to be a precisely similar house in Scotland. But the data produced from this study bring the issues down from the exceptional to the general difference which is around £717 in average circumstances.

### Land Cost

145. In all the many meetings with private housebuilders the view was unanimously expressed that high house prices in Scotland were due in part to high land costs, but in no case was any useful information given to substantiate this. There is a lack of reliable published statistics about the prices paid for land to be developed for private housing, both in England and Scotland, but such data as could be gathered from English auction sales, Register of Sasines, building society and Housing Corporation statistics, have all supported the general conclusion that the prices paid for housing land in Scotland are low compared with prices in England. Without the benefit of a great deal more data, particularly on land costs in England, any figure placed on the cost advantage to the Scottish housebuilder is inevitably statistically suspect, but on the basis of the data assembled during this research it would seem that the cost advantage would average out at £300 per house if not more.

### Solicitor's and Other Fees

146. To some extent conveyancing fees lie outside this consideration of house prices. But clearly the fees represent money that has to be found and paid in full before the purchaser can enter into possession of his house. Therefore, these fees—whatever the amount—bear somewhat hardly on the purchaser, and if he has to meet a greater charge in Scotland than in England then it follows that this will be taken into account in any purchaser's comparison of house prices between the two countries. It has been shown that the fees, on transfer of title to a £5,000 house in Scotland, are £25 10s to £45 15s

more than is involved in a similar transaction in England. This difference is due to existing Scottish legislation which involves the Scottish solicitor in additional work when investigating the title.

147. If the proposals in the Henry Report to the Secretary of State for Scotland (May 1969) on Registration of Title to Land in Scotland are accepted, this imbalance in solicitors' charges should ultimately be corrected.

## Design Characteristics

148. The research which identified the semi-detached two-storey three bedroom house as the most representative in both countries also revealed certain distinct differences in design characteristics, demonstrating a different pattern in demand. The terraced house—a low cost production—is less popular in Scotland than in England, while the most expensive types—the detached two-storey house or bungalow—appear to be marginally more popular in Scotland. This variation in purchaser preference is almost certainly due to a very pronounced difference in the ratios of privately owned to local authority owned houses—1:1 in England, 1:5 in Scotland. English private housebuilders cater for a wide and diverse range of purchaser demand—starting with the £3,000 terraced two-storey house for purchasers in the lower income group. In Scotland there is little or no demand from its lower income group, consequently production is confined to a restricted range of the more costly house types. This lack of demand in Scotland from lower income workers tends to restrict the application of cost-saving industralised techniques which are particularly appropriate to terraced and other lower priced house types. There is also the difficulty that Scottish housebuilders experience in exploiting the full potential of their land stocks which invariably include marginal amenity areas suited to low-priced houses.

## Site Development

149. As a broad generalisation it would seem that the site developer in Scotland is at some cost disadvantage due to a greater incidence of undulating sites. A very substantial research programme would be needed to confirm this and to put a cost against it. Data based on site surveys suggest that Scottish site development and house design do not exploit site contour as economically as in England. Even on level sites the tendency is towards more expensive techniques of foundation and ground floor construction.

150. Scottish purchaser preference is for houses of traditional appearance. Building societies realise this and regulate their advances accordingly. These factors combine in restraining most Scottish housebuilders from "split level" or other contour-dictated designs which reduce costly excavation or underbuilding and provide what may be regarded as more asethetically pleasing designs.

## Materials

151. A substantial amount of research was concentrated on materials, since it was thought initially that a high proportion of the additional cost of Scottish housing was located in this area. It was expected, for example, that transport charges for materials of English manufacture would be quite significant. Apart from bricks it was found generally that transport costs did not worry housebuilders unduly. This apparently was due largely to the overriding benefit of discounts given on bulk orders placed with large English suppliers.

152. Scottish private housebuilders have had to bear with the somewhat spasmodic availability of locally manufactured common bricks, and in regard to facing bricks, local supplies are quite inadequate, due mostly to insufficient basic materials of the right quality. The high cost of transporting facing bricks from England places the Scottish house builder at a distinct cost disadvantage, when facing brickwork is a feature of the

design. Generally he avoids the additional cost by specifying common brickwork for the external wall, rendered and roughcast in the Scottish tradition. But whatever he does to avoid the extra cost of facing bricks there still remains the problem of obtaining common bricks which in Scotland are not only inferior to the English product in strength, quality, size and shape but are more costly than the average English common bricks. The additional cost of common bricks in a single Scottish house at a conservative estimate is around £10.

153. Although there are signs in Scotland of the increased use of lightweight concrete blocks in main walling construction there is scope for much development of blocklaying expertise and block manufacture in Scotland, from which economies in wall construction would flow. There is also the further advantage to the house-purchaser of increased thermal insulation through the use of appropriate blocks. It is quite remarkable that Scotland—richer than most countries in available materials for concrete block production—yet infinitely poorer than most countries in its deposits of clay for the production of bricks, should be using more clay bricks in private houses than any other region in Britain. Comparisons of cost in this research suggest that there could be at least a £20 saving in every house if lightweight concrete blocks were used instead of clay bricks.

154. Roof tiles cost marginally more ex works in Scotland and the distances over which the tiles are transported are greater than in England. Opinions expressed by the two major tiling contractors operating in Scotland indicates that the additional cost of tiling a Scottish roof could be of the order of £15, but conclusive evidence supporting this was unobtainable.

155. The cost of plastering materials, plasterboard, glass, timber and readymixed concrete showed no significant differences. Cement is slightly more costly in Scotland. Based on the amount of cement used in a traditional type house the additional cost is £9 to £14 per house.

156. Manufactured joinery items such as doors, stairs, windows, kitchen cabinets, are mostly imported from England where many large factories concentrate on long "runs" of standardised components. Taking into consideration the relative size of the English private housebuilding annual output, 160,000 houses against Scotland's 8,000, the existence of only a few really large manufactured joinery firms in Scotland is understandable. These large Scottish manufacturers appear unable to compete fully with English firms in the field of standardised house components but hold their own when it comes to the manufacture of "specials" which have little application to private housebuilding. This situation is likely to continue until someone can resolve the impasse arising out of the Scottish manufacturer's insistence on bulk orders before tooling up a long "run" of standardised components—and the builders' reluctance to risk placing bulk orders owing to uncertainties of delivery, price and discounts. It has been shown in several instances throughout this Report that most of the private housebuilding in Scotland is done by some ten large organisations. There is potential collaboration here that could provide a sequence of orders large enough to justify the Scottish production of standardised windows, doors, stairs, kitchen fitments, etc., at prices advantageous to manufacturer, builder and purchaser. As it is, these components cost more to bring them to Scotland and there is little prospect of the situation changing. A computation of the precise cost disadvantage attributable to the use of English manufactured joinery in a Scottish house is hedged around by many variables but £15 would be a reasonable approximation.

## Water Service Regulations

157. Because the 1967 Model Water Byelaws (Scotland) are almost identical to the 1966 English Model, there should be no difference between Scottish and English practice and consequently no cost differences in private housebuilding on either side of the Border. But this research has shown that the differences in practice which existed prior to 1967, do in fact continue to exist and are likely to do so for some considerable time until

Scottish plumbers and builders become fully aware of the changed circumstances relating to the powers of Scottish Water authorities. Additional requirements under the old water regulations are still followed in current housebuilding practice and it has been shown in the Report that this represents an additional cost to the Scottish house of £35 9s 5d. In certain circumstances this extra cost could be extended to a total of nearly £50. Understandably, Scottish water authorities, builders and plumbers who have been operating better standards than obtain in England for many years, are reluctant to reduce standards. As one eminent Scottish water engineer wrote, "If I am correct in thinking that the total additional cost due to the requirements of Scottish Water undertakers as opposed to English undertakers amounts to £35 9s 5d I feel there are many who would argue that the advantages obtained from these additional requirements were well worth the extra cost involved." Clearly the "levelling down" process of Scottish standards to English standards has statutory sanction in the 1967 Model Byelaws but it will be some years before the effect is clearly seen, even in what some might regard as the "common denominator" of the industry—the private housing sector. Until then, the water service in a Scottish house will cost £35 to £50 more.

## Building Regulations

158. The Building Standards (Scotland) Regulations 1963 are wider in scope than the Building Regulations 1965 controlling building in England and Wales. An exhaustive comparative study of the two sets of regulations revealed many instances where the Scottish regulation demanded a higher standard than the English regulation. There was also a considerable number of Scottish regulations covering situations or circumstances that were not provided for in the English code. The most significant omission in the English regulations was a requirement for space standards. Other omissions concerned fuel storage, clothes drying facilities, storage cupboards, safety of children near open fires, paths, and certain requirements for drains, stairs, etc.

159. There are many examples of more stringent requirements in the Scottish regulations which have not been mentioned in the text of this Report, simply because it has not been possible to set an accurate cost against the particular requirements. For example space requirements in terms of proximity of houses are particularly demanding and take up an additional amount of costly land. Much is said in England about "Parker Morris" standards, but the recommendations are not mandatory and there was no evidence that they are being followed, particularly with respect to minimum areas. In Scotland, statutory space standards have to be observed and throughout the research—particularly in the house price survey, the analysis of the Co-operative Permanent Building Society's statistics and an elemental cost analysis of apparently similar houses each side of the Border—an additional area of 30 to 40 sq. ft was consistently observed in the Scottish house. This additional area accounted for a substantial part of the price discrepancy—approximately £105 based on an average of 35 sq. ft additional area.

160. Other Scottish regulation requirements involving additional cost concerned access to roofs, special windows, drying facilities, drainage, and fire and safety precautions. When costed these additional items came to approximately £32 which together with the cost implication of the regulation for space standards made a total of £137. The £5 item mentioned in paragraph 71 for a second drainage test was not shown conclusively to be a charge sustained by all builders. The additional £7 10s for pivoted sash windows (paragraph 71) is only marginally supported by research data. The practice in Scotland of applying a chimney sweeping technique appropriate for high tenement buildings to low-rise houses is not only odd but is costly to the housebuilder who is bound by regulation to provide access to roof and chimney. It is also costly to the house owner when the roof covering or chimney is damaged and it is a most dangerous procedure for Scottish chimney sweeps.

## Traditional Influences on Cost

161. Scottish material resources, climate and traditional procedures have been responsible for the evolution of building techniques which are quite different to the techniques practiced in England. While many of these Scottish techniques have disappeared the traditional practice of roof sarking has persisted. There is little doubt that a counter-battened, fully sarked roof represents a first class standard of construction. But it costs £44 extra for wood boarding or about £26 if insulation board or other similar material is used. To a lesser extent there is a traditional leaning towards suspended wood joist floor construction at ground level. The advantages are not so apparent as sarking on a roof. Indeed it is difficult to discover any advantage. One gains a certain amount of resilience in wood boarding on joists but any warmth claimed for the timber floor as against solid concrete is quite illusory because the ventilated space beneath makes for a cold floor. It is also susceptible to rot, worm and beetle. In normal conditions with a level site the suspended wood joist floor is more costly but it is consistently favoured by tradition and by the Scottish purchaser. The additional cost depends greatly on site conditions but a fair price in average circumstances would be about £25.

162 The practice of leaving windows to be built in afterwards is peculiar to Scotland. This is costed at £12 on the basis of £1 10s a window. Mobile hoists are used much more in Scottish low-rise house-building. This is probably due to the employment of direct labour rather than labour-only sub-contracting. Additional cost on a hire basis is £12.

163. The extremely low standard of brickwork craftsmanship in Scotland is bound to cause additional cost in the production of a Scottish house. This arises out of expensive rectification of rough brickwork by following trades, and it would take a substantial amount of research based on work study to determine precisely the cost of the rectification of the basic shells of houses which are so frequently out of alignment, out of level and out of plumb. The standard of other Scottish trades—carpentry, plumbing, plastering, painting, roof tiling—is as good as, if not better than the standard in England, indeed in the Scottish private housebuilding sector where English builders now operate extensively the Scottish carpenter and joiner is frequently involved in a "levelling down" of standard.

164. The persistence of the trade practice of using an internal scaffold does not encourage a high standard of craftsmanship in any part of the external fabric or component of the building which has to be built, applied or fixed from the inside by leaning out. In the present circumstances the avoidance of an external scaffold common to English practice possibly saves the Scottish housebuilder about £20 a house but this is offset by rectification costs and loss of productivity through makeshift access procedures. The ultimate saving in cost might amount to £10 or more per house but the calculation of a precise figure would have to be based on evidence from a formidable work study programme.

## Productivity

165. The cost of labour in building traditional type private houses represents 40–50% of the total building cost (excluding land). This imposes considerable emphasis on any conclusions drawn in the context of productivity. According to the Prices and Incomes Board, Scotland has now become a region of high earnings for building craftsmen. Yet it is something of a paradox that available statistics indicate productivity in building work to be generally significantly lower in Scotland than in all other regions in Britain. What can be said with reasonable certainty is that there are critical shortages of building craftsmen in the central industrial belt and these shortages extend into the private sector. The shortage of building craftsmen is similar to that experienced in London, the South East and the Midlands, but in those areas the private sector has benefited immensely from the very high incidence of labour-only sub-contracting. This pattern of labour supply is common all over England except in the extreme north and it has been shown to result in lower labour costs to the builder.

166. In Scotland, the trade unions (the strongest and most vigilant in the entire building industry) maintain close control over their membership with regard to labour-only sub-contracting which they have always resolutely opposed. The building employers' federation in Scotland have expressed disapproval of labour-only sub-contracting but there is little doubt that many private housebuilders who have had experience of it in England would like the opportunity of using this contracting method in Scotland. In the absence of reliable detailed information on work schedules and payments agreed between English housebuilders and labour-only sub-contracting it has not been possible to make a costed comparison of productivity in the respective private housebuilding sectors. The reliable conclusion of the Phelps-Brown Committee that labour-only sub-contracting assures lower labour costs suggests that Scottish housebuilders operate at a cost disadvantage through their inability to use it, and it is impossible to ignore the sheer weight of evidence throughout this Report which suggests that the productivity of the Scottish building worker compares badly with that of his colleagues in England.

167. With regard to earnings, the statistical evidence indicates that the Scottish building worker earns about £2 a week more than the English building worker. Even if the level of productivity is equal in the two countries and one assumes that it takes 2,000 man hours to build an average house, then on the basis of £2 a week additional earnings the average house in Scotland will cost £100 more to build.

## Pattern of Firms and Scale of Operations

168. At many stages throughout the research distinct differences were observed in the organisational pattern of the respective housebuilding industries. In England the pattern of housebuilding firms is extremely diverse and the output of large firms has little impact on the general supply situation. For example the largest private housebuilder builds about 5% of the U.K. total and the second largest well under 2%. In Scotland there is a remarkably different pattern of firms. Over 1967 and 1968 the largest private housebuilder in Britain built almost one quarter of the entire output of private houses in Scotland, and together with nine other large firms was responsible for five-eighths to three-quarters of the total Scottish output. Clearly this massive contribution from a small group of large firms raises serious economic implications. In England the contribution from small and medium firms is very considerable and helps to ensure a freely competitive situation of supply and demand. In Scotland the incidence of smaller firms is comparatively negligible, consequently the contribution from these firms has little impact on the total output. In a situation where production is dominated by the output of a relatively small number of firms one cannot disregard recently published statistics indicating that over the past five years the selling prices of new houses have risen at a greater rate in Scotland than in all other regions.

## Climate and Daylight

169. Rainfall at a rate sufficient to suspend outdoor building operations occurs more frequently in Scotland than in England. The increased frequency is about 40%, and it is probably true to state that the outdoor building worker on a Scottish site loses more time than he would in England. But this factor of critical rate is a very imperfect basis for a precise statement of time lost, and there is also the further complication of the "guaranteed week". Daylight can be measured with more precision. It has been shown in this Report that the additional loss of daylight during the winter months in Scotland taken together with an approximate figure for loss of time during excessive rainfall totals to at least £26 per house.

## Summary of Cost Differences

170. The cost differences between Scotland and England are summarised in the following table.

Comparison of Additional Costs against the Price Difference of £717

| Item | Section Reference | Para. | Commentary | Cost | |
|---|---|---|---|---|---|
| 1 | Lack of demand for low-cost house | 148 | Scottish housebuilder unable to diversify output or exploit full potential of marginal land | Not assessable | |
| 2 | Site Development | 149<br>150 | Tendency to hilly sites in Scotland<br>Lack of design flexibility | Not assessable | |
| 3 | Materials<br>Materials | 152<br>153 | Additional cost of common bricks<br>Scottish reluctance to use light-weight concrete blocks | 10<br>20 | |
| 4 | Materials | 154 | Additional cost of tiling Scottish house | 15 | |
| 5 | Materials | 155 | Cement | 14 | |
| 6 | Materials | 156 | Import of stairs, doors, kitchen fitments, and other manufactured joinery from England | 15 | |
| 7 | Water Services | 157 | Extra pipework, fittings, storage tank | 35 | |
| 8 | Building Regulations | 159 | Space requirements—proximity of houses | Not assessable | |
| 9 | Building Regulations | 159 | Space requirements—internal space in house | 105 | |
| 10 | Building Regulations | 160 | Access to roof, special window hinges, drying facilities, drainage traps, fire and safety precautions | 32 | |
| 11 | Traditional Practices | 161 | Wood boarded sarking to roof (Note that the higher cost taken here rather than the lower cost for sarking of cheaper material) | 44<br>44 | |
| 12 | Traditional Practices | 161 | Suspended wood joist ground floor | 25 | |
| 13 | Traditional Practices | 162 | Building-in windows after walls have been constructed | 12 | |
| 14 | Traditional Practices | 162 | Use of mobile hoists | 12 | |
| 15 | Productivity | 166 | Lower productivity of Scottish building worker | Not assessable | |
| 16 | Earnings | 167 | Higher earnings of Scottish building worker | 100 | |
| 17 | Climate and Daylight | 169 | Excessive rainfall, reduced daylight | 26 | |
| | | | Totals to be reconciled | 465 | 717 |
| | | | Additional Cost Unaccounted for . . . . | | £252 |

Comparison of Additional Costs
(On the assumption of reduced land cost)

| | | | | | |
|---|---|---|---|---|---|
| 18 | Land Cost | 145 | Available statistics have supported the conclusion that building land is cheaper in Scotland. At a conservative estimate the saving per house is | c/f<br>+ | 252<br>300 |
| | | | Cost Unaccounted for . . . | | £552 |

*NOTE:* These comparisons do *not* include the £45 or so for additional legal costs which many Scottish purchasers have to pay nor the slightly higher level of legal costs which a builder in Scotland may incur in connection with the disposal of a house plot.

Some of these figures represent no more than the closest estimate possible in circumstances of very considerable complexity. In arriving at them much care has been taken to hold the scales fairly between the cost advantages and the cost disadvantages to Scottish private housebuilders. Stated briefly, the sum total of achievement is that subject to the items classified as "non-assessable", there now exists a close and reliable estimate of the price gap between the English and Scottish house and the additional cost attributable to:

(1) compliance with higher standards set by the Scottish building regulations;

(2) the traditional observance of higher standards of water service installation, roof and floor construction;

(3) the severity of the Scottish climate and the loss of daylight hours during the winter;

(4) the higher earnings of the Scottish building worker.

Items (1) and (2) represent about £250's worth of comfort for the owner of the average newly-built house in Scotland. He is at least assured that his house is generally bigger and better than an English house of comparable accommodation and location.

171. This final statement of known costs set against the known value for the price gap of £717 still leaves £252 (or £552 if the favourable land cost differential is taken into account) unaccountable, for this sum could not be allocated without free access to records which understandably are extremely confidential to builders. The area of accountability seems to narrow down to the two main factors—productivity and profit. Evidence in this Report has suggested that the Scottish building workers' productivity rate is lower than most, but English housebuilders' private records showing what they pay and what they get in relation to "labour-only sub-contracting" might well reveal astonishing productivity data that could bring a sense of balance to official statistics on productivity in the private sector. With regard to any assessment of builders' profit margins, this must obviously remain a matter for conjecture.

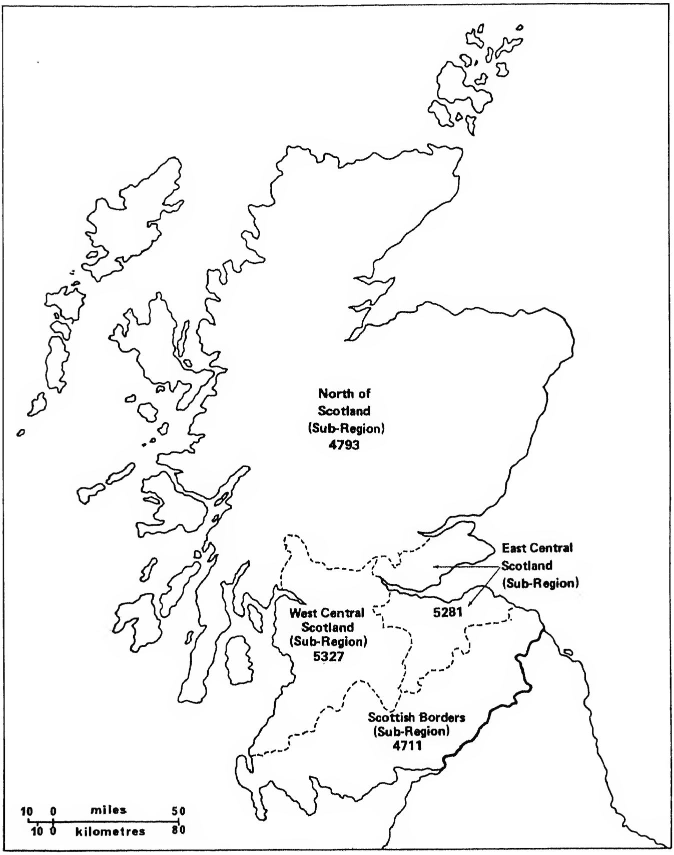
## SURVEY I

### House Prices by Region for 167 Housebuilders

| Economic Planning Region | | Number of Housebuilders Sampled | Number of Estates Sampled | Average Selling Price* £ | Average Living Area† (Sq. ft) | Average Selling price per sq. ft £ s d |
|---|---|---|---|---|---|---|
| North of Scotland . | SR | 8 | 13 | 4,793 | 703 | 6 16 4 |
| East Central Scotland | SR | 19 | 44 | 5,281 | 669 | 7 17 10 |
| West Central Scotland | SR | 15 | 67 | 5,327 | 684 | 7 15 9 |
| Scottish Borders . | SR | 2 | 9 | 4,711 | 657 | 7 3 5 |
| SCOTLAND . . . | | 37 | 133 | 5,218 | 679 | 7 13 8 |
| NORTHERN . . . | | 15 | 56 | 4,219 | 652 | 6 9 6 |
| YORKSHIRE . . . | | 11 | 66 | 4,086 | 637 | 6 8 3 |
| NORTH-WEST . . . | | 22 | 66 | 4,335 | 628 | 6 18 0 |
| EAST MIDLANDS . . | | 16 | 64 | 4,184 | 647 | 6 9 5 |
| WEST MIDLANDS . . | | 18 | 54 | 4,360 | 642 | 6 15 10 |
| EAST ANGLIA . . . | | 8 | 14 | 4,835 | 660 | 7 6 6 |
| SOUTH WEST . . . | | 12 | 58 | 4,563 | 635 | 7 3 8 |
| Beds/Essex/Herts . | SR | 11 | 36 | 5,656 | 643 | 8 16 0 |
| Southern Counties . | SR | 18 | 43 | 5,210 | 640 | 8 2 10 |
| South-Eastern Counties | SR | 13 | 29 | 5,964 | 653 | 9 2 8 |
| Greater London . | SR | 6 | 8 | 7,839 | 702 | 11 3 4 |
| SOUTH-EAST . . . | | 41 | 116 | 5,718 | 648 | 8 16 6 |
| ENGLAND . . . . | | 130 | 494 | 4,637 | 642 | 7 4 4 |

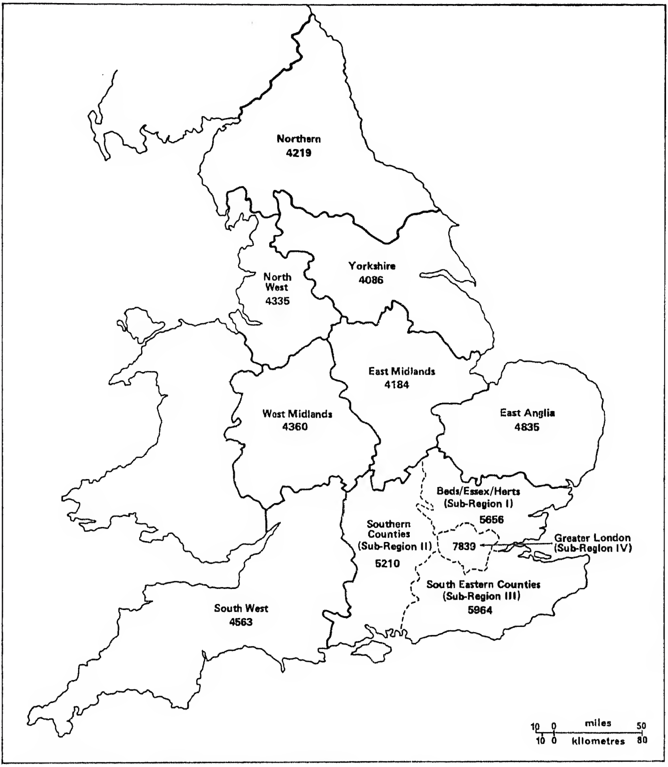
*refers to 3 bedroom semi-detached house inclusive of central heating and garage.
†refers to area of living accommodation exclusive of hall and bathroom.
SR refers to Sub-Region.

**Scotland: £5,218**


North of Scotland (Sub-Region) 4793
East Central Scotland (Sub-Region)
5281
West Central Scotland (Sub-Region) 5327
Scottish Borders (Sub-Region) 4711
10 0 miles 50
10 0 kilometres 80

Regional Variation in House Prices (37 Housebuilders)

**England: £4,637**



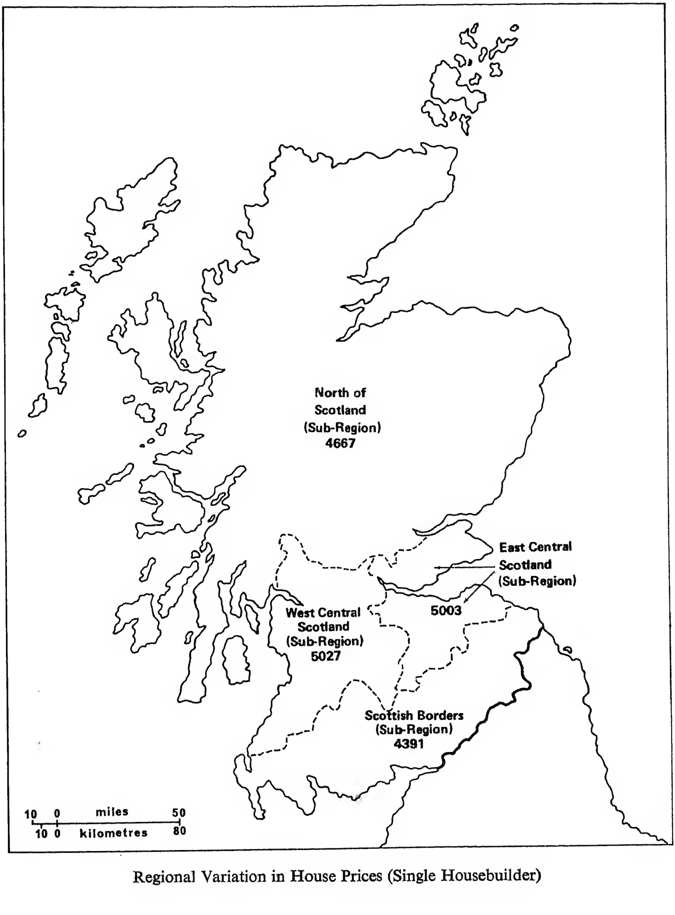
Regional Variation in House Prices (130 Housebuilders)

## House Prices by Region for a Single Housebuilder

| Economic Planning Region | | Number of Housebuilders Sampled | Number of Estates and/or House Types Sampled | Average Selling Price* | Average Living Area† | Average Selling price per sq. ft | | |
|---|---|---|---|---|---|---|---|---|
| | | | | £ | (Sq. ft) | £ | s. | d. |
| North of Scotland | SR | 1 | 3 | 4,667 | 649 | 7 | 3 | 10 |
| East Central Scotland | SR | | 11 | 5,003 | 649 | 7 | 14 | 2 |
| West Central Scotland | SR | | 25 | 5,027 | 649 | 7 | 14 | 11 |
| Scottish Borders | SR | | 4 | 4,391 | 653 | 6 | 14 | 6 |
| SCOTLAND | | | 43 | 4,937 | 649 | 7 | 12 | 1 |
| NORTHERN | | | 31 | 4,195 | 639 | 6 | 11 | 4 |
| YORKSHIRE | | | 38 | 4,095 | 624 | 6 | 11 | 3 |
| NORTH-WEST | | | 34 | 4,479 | 625 | 7 | 3 | 4 |
| EAST MIDLANDS | | | 40 | 4,197 | 645 | 6 | 10 | 2 |
| WEST MIDLANDS | | | 19 | 4,551 | 636 | 7 | 3 | 1 |
| EAST ANGLIA | | | 2 | 4,505 | 622 | 7 | 4 | 10 |
| SOUTH-WEST | | | 35 | 4,567 | 634 | 7 | 4 | 1 |
| Beds/Essex/Herts | SR | | 23 | 5,878 | 632 | 9 | 6 | 0 |
| Southern Counties | SR | | 9 | 5,350 | 620 | 8 | 12 | 7 |
| South-Eastern Counties | SR | | 2 | 6,041 | 619 | 9 | 15 | 2 |
| Greater London | SR | | 1 | 6,795 | 642 | 10 | 11 | 8 |
| SOUTH-EAST | | | 35 | 5,778 | 629 | 9 | 3 | 9 |
| ENGLAND | | | 234 | 4,544 | 633 | 7 | 3 | 7 |

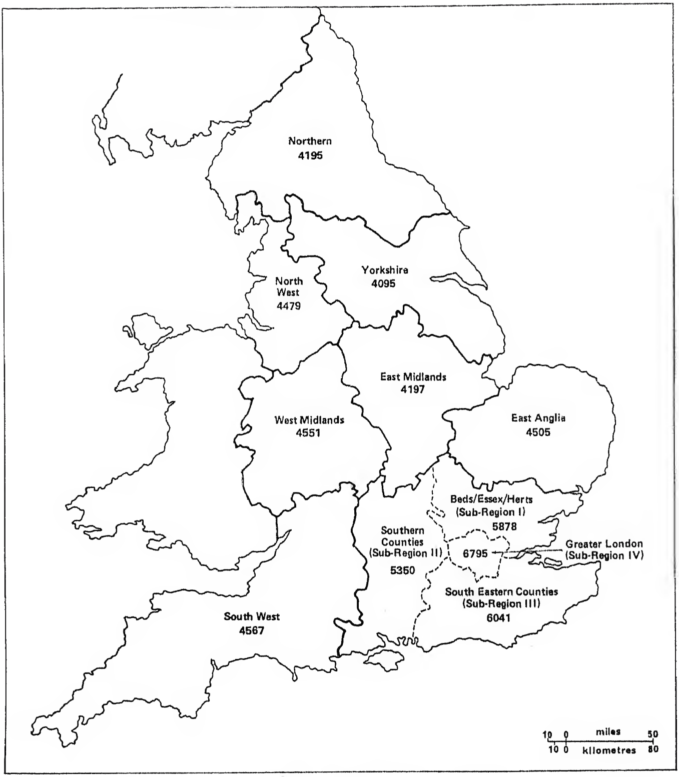
*refers to 3 bedroom semi-detached house inclusive of central heating and garage.
†refers to area of living accommodation exclusive of hall and bathroom.
SR refers to Sub-Region.

Scotland: £4,937


North of Scotland (Sub-Region) 4667
East Central Scotland (Sub-Region) 5003
West Central Scotland (Sub-Region) 5027
Scottish Borders (Sub-Region) 4391
10 0 miles 50
10 0 kilometres 80

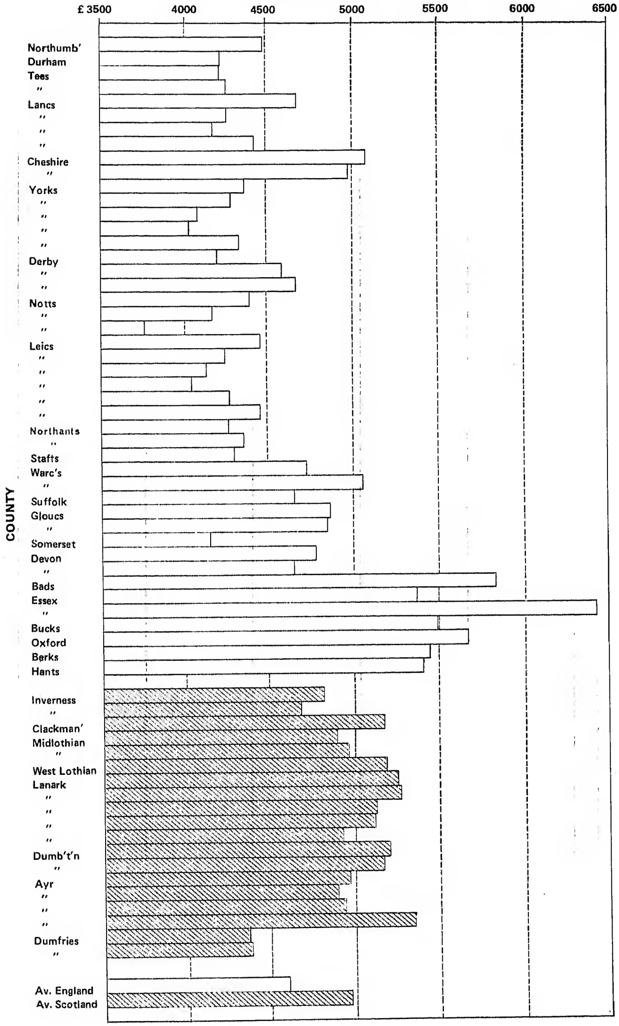
Regional Variation in House Prices (Single Housebuilder)

**England: £4,544**



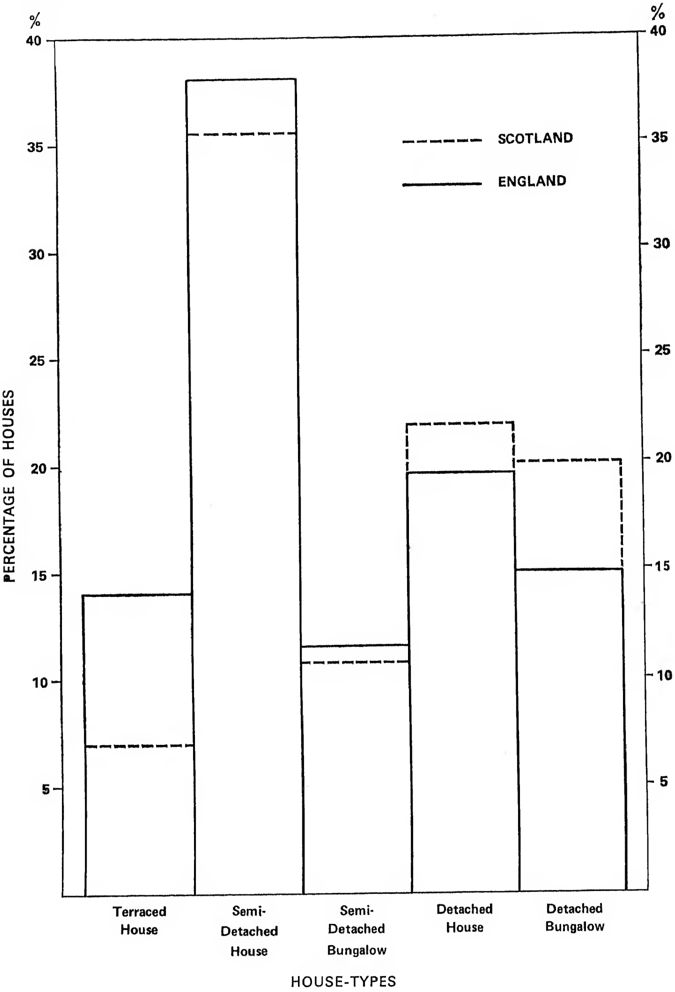
Regional Variation in House Prices (Single Housebuilder)

## House Prices by Counties relating to One House Type by One Particular Building Contractor

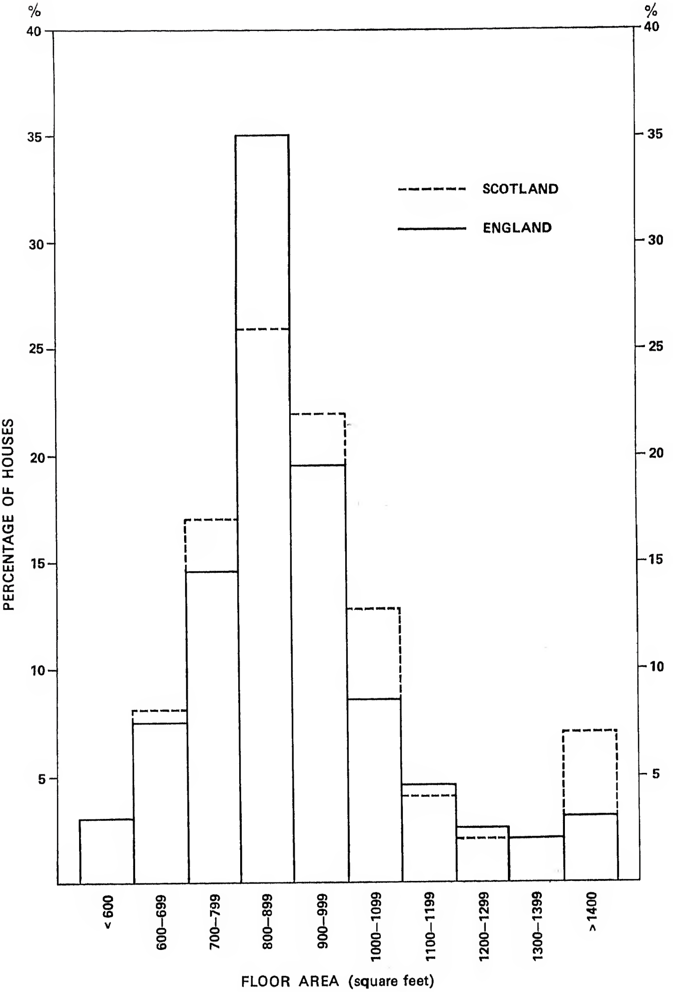


## APPENDIX B

### HISTOGRAM 1



## HISTOGRAM 2


%
%
40
35
30
25
20
15
10
5
PERCENTAGE OF HOUSES
SCOTLAND
ENGLAND
< 600
600–699
700–799
800–899
900–999
1000–1099
1100–1199
1200–1299
1300–1399
>1400
FLOOR AREA (square feet)

## APPENDIX C
## TABLE 1

### Output per Operative (£ per Quarter) based on MPBW Construction Supplement Tables 8 and 12

First
Quarter
1968

| | REGION | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SOUTH EAST | | | | | | | | |
| Size of Firm (Operatives) | Northern | Yorks/ Humber | East Midlands | East Anglia | London | Eastern Counties | Southern Counties | South Eastern Counties | South West | Wales | West Midlands | North West | Scotland |
| 2–7 | 783·8 | 857·2 | 1,000·0 | 960·0 | 1,200·0 | 1,378·0 | 1,250·0 | 1,107·0 | 984·1 | 1,027·0 | 1,015·0 | 838·7 | 579·7 |
| 8–13 | 631·6 | 676·0 | 711·1 | 730·8 | 897·4 | 885·7 | 916·7 | 767·8 | 650·8 | 777·8 | 830·6 | 723·7 | 500·0 |
| 14–24 | 612·2 | 674·4 | 716·7 | 638·9 | 876·0 | 866·7 | 868·9 | 747·0 | 682·4 | 666·7 | 781·7 | 708·7 | 510·4 |
| 25–34 | 629·6 | 750·0 | 769·2 | 727·3 | 944·4 | 966·7 | 795·5 | 822·2 | 735·9 | 760·0 | 1,019·0 | 728·6 | 568·9 |
| 35–59 | 625·0 | 705·9 | 750·0 | 666·7 | 941·2 | 925·0 | 833·3 | 732·4 | 643·8 | 744·2 | 926·7 | 760·4 | 590·4 |
| 60–79 | 633·3 | 657·1 | 833·3 | 700·0 | 1,042·0 | 1,043·0 | 1,000·0 | 868·4 | 710·5 | 733·3 | 880·0 | 760·0 | 574·1 |
| 80–114 | 641·0 | 734·7 | 825·0 | 925·9 | 1,022·0 | 1,059·0 | 1,065·0 | 1,081·0 | 833·3 | 789·5 | 963·6 | 842·1 | 577·5 |
| 115–299 | 803·9 | 854·8 | 888·9 | 716·9 | 992·2 | 1,298·0 | 1,012·0 | 1,056·0 | 887·6 | 851·1 | 1,000·0 | 828·2 | 689·9 |
| 300–599 | 828·6 | 884·0 | 954·5 | | 934·1 | 1,077·0 | 1,086·0 | 1,063·0 | | 853·7 | 1,238·0 | 811·8 | 820·3 |
| 600–1,199 | 815·5 | 964·3 | 898·5 | 895·8 | 1,027·0 | 783·8 | 1,577·0 | 1,107·0 | 826·1 | 857·1 | 1,195·0 | 689·2 | 926·8 |
| 1,200 (and over) | | | | | 1,072·0 | 840·7 | | | | | | 953·8 | 838·0 |

## TABLE 2

### Output per Operative (£ per Quarter) based on MPBW Construction Supplement Tables 7 and 10

First
Quarter
1968

REGION

| Trade of Firm | Northern | Yorks/ Humber | East Midlands | East Anglia | SOUTH EAST |  |  |  | South West | Wales | West Midlands | North West | Scotland |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  | London | Eastern Counties | Southern Counties | South Eastern Counties |  |  |  |  |  |
| General Builder . | 701·0 | 789·0 | 825·4 | 714·3 | 870·8 | 1,092·0 | 910·0 | 830·6 | 723·5 | 815·1 | 954·4 | 834·0 | 630·7 |
| B. & C.E. Contractor | 765·8 | 849·3 | 889·6 | 840·2 | 1,048·0 | 946·3 | 1,230·0 | 1,110·0 | 762·5 | 776·7 | 1,136·0 | 880·6 | 753·5 |
| Civil Engineers . | 1,041·0 | 1,022·0 | 1,061·0 | 1,050·0 | 1,081·0 | 756·1 | 1,192·0 | 982·5 | 1,071·0 | 1,103·0 | 975·6 | 898·3 | 983·9 |
| Plumbers . . | 1,000·0 | 871·8 | 955·0 | 750·0 | 1,200·0 | 1,000·0 | 1,125·0 | 1,063·0 | 909·0 | 875·0 | 1,100·0 | 680·0 | 717·0 |
| Joiners & Carpenters | 750·0 | 750·8 | 857·1 | 1,400·0 | 909·0 | 857·1 | 947·4 | 944·4 | 750·0 | 1,250·0 | 833·3 | 636·4 | 595·4 |
| Painters . . | 425·5 | 484·8 | 512·2 | 666·6 | 712·1 | 692·3 | 695·5 | 812·5 | 600·0 | 500·0 | 561·0 | 400·0 | 387·5 |
| Roofers . . | 857·1 | 916·6 | 1,143·0 | 1,000·0 | 1,375·0 | 3,000·0 | 1,750·0 | 1,417·0 | 1,000·0 | 1,000·0 | 1,500·0 | 1,087·0 | 666·6 |
| Plasterers . . | 526·3 | 523·8 | 571·4 | 571·4 | 778·9 | 666·6 | 750·0 | 750·0 | 636·4 | 666·6 | 647·1 | 518·5 | 535·7 |

TABLE 3

**Output per Operative (£ per Quarter) based on MPBW Construction Supplement Tables 6 and 13** First Quarter 1968

| REGION | New Housing | | | Other New Work | | | | Repair and Maintenance | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Private Sector | Public Sector | Total | Private Sector | | Public Sector | Total | Housing Private and Public | Non-Housing | | Total | |
| | | | | Industrial | Non-Industrial | | | | Private Sector | Public Sector | | |
| Northern . . . | 771·3 | 753·4 | 769·7 | 762·4 | 689·3 | 934·8 | 818·2 | 581·1 | 511·6 | 592·6 | 562·5 | 730·8 |
| Yorks/Humber . . | 977·6 | 900·0 | 944·4 | 876·4 | 750·0 | 891·5 | 851·5 | 603·8 | 596·8 | 571·4 | 594·5 | 807·7 |
| East Midlands . . | 1,064·0 | 942·9 | 1,017·0 | 1,093·0 | 652·2 | 982·0 | 910·3 | 642·0 | 574·5 | 611·1 | 615·9 | 863·3 |
| East Anglia . . . | 913·0 | 846·1 | 888·9 | 823·5 | 780·5 | 911·8 | 853·2 | 563·6 | 571·4 | 764·7 | 602·2 | 796·5 |
| London . . . | 1,235·0 | 1,026·0 | 1,092·0 | 1,135·0 | 1,000·0 | 1,110·0 | 1,088·0 | 846·1 | 771·9 | 925·6 | 853·4 | 1,033·0 |
| Eastern Counties . . | 1,414·0 | 962·2 | 1,220·0 | 1,081·0 | 925·9 | 1,052·0 | 1,033·0 | 763·6 | 695·6 | 567·6 | 686·9 | 995·6 |
| Southern Counties . | 1,378·0 | 1,213·0 | 1,315·0 | 1,235·0 | 982·5 | 1,370·0 | 1,236·0 | 670·1 | 675·8 | 756·8 | 690·0 | 1074·0 |
| South East Counties . | 1,220·0 | 1,136·0 | 1,190·0 | 962·2 | 946·3 | 1,064·0 | 1,015·0 | 652·2 | 588·2 | 780·5 | 666·7 | 944·7 |
| South West . . . | 967·2 | 902·4 | 941·1 | 881·0 | 737·7 | 887·8 | 840·8 | 595·4 | 540·0 | 642·9 | 591·9 | 785·0 |
| Wales . . . . | 1,056·0 | 836·1 | 930·3 | 793·1 | 781·2 | 925·9 | 866·2 | 638·3 | 565·2 | 678·6 | 632·7 | 825·4 |
| West Midlands . . | 1,386·0 | 1,119·0 | 1,255·0 | 1,067·0 | 838·3 | 1,156·0 | 1,051·0 | 697·0 | 662·0 | 839·5 | 721·2 | 1,030·0 |
| North West . . . | 1,223·0 | 788·1 | 1,000·0 | 883·9 | 723·6 | 908·5 | 854·8 | 619·0 | 641·5 | 562·5 | 614·9 | 818·1 |
| Scotland . . . | 673·9 | 769·0 | 747·0 | 794·6 | 634·6 | 861·9 | 788·7 | 478·8 | 514·7 | 517·2 | 494·4 | 697·1 |

TABLE 4

## Analysis based on Location of Firm derived from MPBW Construction Supplement Tables

First Quarter 1968

| REGION | STAFF A | WORKERS B | RATIO B/A | OUTPUT PER | | Total Employment C | Number of Firms D | Average Size of Firm C/D |
|---|---|---|---|---|---|---|---|---|
| | | | | Worker £ | Employee £ | | | |
| Northern . . | 8,589 | 56,007 | 6·52 | 693·9 | 600·7 | 64,596 | 3,544 | 18·2 |
| Yorks/Humber . | 14,995 | 84,093 | 5·61 | 750·4 | 636·8 | 99,088 | 7,222 | 13·7 |
| East Midlands . | 11,826 | 62,337 | 5·27 | 799·0 | 670·1 | 74,163 | 5,304 | 14·0 |
| East Anglia . . | 5,833 | 36,756 | 6·30 | 745·5 | 643·4 | 42,589 | 2,589 | 16·5 |
| London . . . | 82,134 | 259,809 | 3·16 | 1,002·0 | 761·1 | 341,943 | 11,050 | 30·9 |
| Eastern Counties . | 12,119 | 48,497 | 4·00 | 923·8 | 730·1 | 60,616 | 4,217 | 14·1 |
| Southern Counties . | 14,265 | 55,997 | 3·93 | 984·0 | 784·2 | 70,262 | 5,677 | 12·4 |
| South East Counties | 15,726 | 64,897 | 4·13 | 869·0 | 699·6 | 80,623 | 6,644 | 12·1 |
| South West . . | 12,310 | 69,344 | 5·63 | 710·9 | 603·3 | 81,654 | 7,298 | 11·2 |
| Wales . . . | 5,716 | 39,229 | 6·86 | 746·9 | 651·9 | 44,945 | 4,058 | 11·1 |
| West Midlands . | 22,389 | 94,926 | 4·24 | 965·0 | 780·9 | 117,315 | 7,508 | 15·6 |
| North West . . | 22,898 | 109,452 | 4·78 | 763·8 | 631·7 | 132,350 | 9,125 | 14·5 |
| Scotland . . | 19,561 | 116,068 | 5·93 | 670·0 | 573·6 | 135,629 | 5,803 | 23·4 |

TABLE 5

## Occupational Analysis of Wholly Unemployed Adults: Selected Building Crafts

| | | ENGLAND AND WALES | | | SCOTLAND | | |
|---|---|---|---|---|---|---|---|
| | | Wholly Unemp. | Unfilled Vacancies | Ratio Demand/ Supply | Wholly Unemp. | Unfilled Vacancies | Ratio Demand/ Supply |
| Sept. 1964 | Carpenters/Joiners | 753 | 4,901 | 6·5:1 | 83 | 541 | 6·5:1 |
| | Bricklayers | 402 | 2,014 | 5:1 | 80 | 110 | 1·4:1 |
| | Plasterers | 134 | 452 | 3·4:1 | 37 | 50 | 1·4:1 |
| | Painters | 1,638 | 2,839 | 1·7:1 | 281 | 97 | 0·3:1 |
| | Plumbers | 485 | 1,407 | 2·9:1 | 168 | 163 | 1:1 |
| Dec. 1964 | Carpenters/Joiners | 907 | 4,595 | 5:1 | 124 | 447 | 3·6:1 |
| | Bricklayers | 638 | 1,759 | 2·8:1 | 147 | 52 | 0·4:1 |
| | Plasterers | 194 | 432 | 2·2:1 | 56 | 23 | 0·4:1 |
| | Painters | 3,755 | 1,008 | 0·3:1 | 500 | 62 | 0·1:1 |
| | Plumbers | 646 | 1,398 | 2·2:1 | 114 | 165 | 1·4:1 |
| Mar. 1966 | Carpenters/Joiners | 1,459 | 2,984 | 2:1 | 161 | 461 | 2·9:1 |
| | Bricklayers | 788 | 1,972 | 2·5:1 | 147 | 116 | 0·8:1 |
| | Plasterers | 249 | 284 | 1·1:1 | 37 | 41 | 1·1:1 |
| | Painters | 3,610 | 1,717 | 0·5:1 | 389 | 105 | 0·3:1 |
| | Plumbers | 685 | 1,734 | 2·5:1 | 137 | 201 | 1·5:1 |
| June 1967 | Carpenters/Joiners | 3,536 | 1,940 | 0·5:1 | 330 | 296 | 0·9:1 |
| | Bricklayers | 1,640 | 1,460 | 0·9:1 | 214 | 80 | 0·4:1 |
| | Plasterers | 788 | 232 | 0·3:1 | 84 | 13 | 0·2:1 |
| | Painters | 5,297 | 1,555 | 0·3:1 | 472 | 127 | 0·3:1 |
| | Plumbers | 2,255 | 799 | 0·4:1 | 267 | 134 | 0·5:1 |
| Sept. 1968 | Carpenters/Joiners | 3,271 | 2,261 | 0·7:1 | 295 | 356 | 1·2:1 |
| | Bricklayers | 1,862 | 1,547 | 0·8:1 | 157 | 122 | 0·8:1 |
| | Plasterers | 741 | 239 | 0·3:1 | 66 | 28 | 0·4:1 |
| | Painters | 4,569 | 1,773 | 0·4:1 | 258 | 55 | 0·2:1 |
| | Plumbers | 2,119 | 1,146 | 0·5:1 | 342 | 117 | 0·3:1 |
| Dec. 1968 | Carpenters/Joiners | 4,523 | 1,380 | 0·3:1 | 421 | 241 | 0·6:1 |
| | Bricklayers | 3,325 | 645 | 0·2:1 | 219 | 129 | 0·6:1 |
| | Plasterers | 1,075 | 174 | 0·2:1 | 94 | 17 | 0·2:1 |
| | Painters | 8,236 | 609 | 0·1:1 | 693 | 72 | 0·1:1 |
| | Plumbers | 2,558 | 1,197 | 0·5:1 | 382 | 55 | 0·1:1 |

Based on Department of Employment and Productivity Quarterly Statistics.

## TABLE 6

### Extract from Digest of Scottish Statistics April 1969: Labour Unemployment in Construction (Thousands)

| Year | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1964 | 16·6 | 15·3 | 14·0 | 13·3 | 12·1 | 10·6 | 10·8 | 10·9 | 10·2 | 10·3 | 10·4 | 11·2 | The monthly figures relate to about the middle of the month. |
| 1965 | 12·9 | 13·3 | 11·8 | 10·1 | 9·3 | 8·2 | 8·6 | 9·0 | 8·5 | 8·8 | 8·9 | 11·7 | |
| 1966 | 11·8 | 10·3 | 9·0 | 8·5 | 7·7 | 7·6 | 8·1 | 8·4 | 9·0 | 10·0 | 11·9 | 13·4 | |
| 1967 | 16·6 | 15·0 | 14·4 | 14·0 | 13·5 | 12·7 | 13·2 | 13·7 | 13·3 | 13·7 | 14·4 | 14·8 | |
| 1968 | 18·0 | 16·4 | 15·4 | 14·6 | 13·7 | 13·3 | 14·0 | 14·1 | 13·6 | 14·0 | 14·3 | 14·4 | |
| 1969 | 17·3 | 16·9 | | | | | | | | | | | |

### Unemployed **Craftsmen** Actual on 8th January 1968—Source D.E.P. Unpublished Data

| Classification | Unemployed | Vacancies |
|---|---|---|
| Carpenter and Joiner | 465 | 93 |
| Bricklayer . . | 447 | 51 |
| Slater . . . | 141 | 16 |
| Plasterer . . . | 148 | 37 |
| Plumber . . . | 263 | 54 |
| Painter . . . | 836 | 47 |
| TOTAL . | 2,300 | 298 |

TABLE 7

## Effect of Region and Occupation on Average Weekly Earnings

| Full-Time Men Manual Workers | | | | Full-Time Men Manual Workers Manufacturing Industries | | | | Full-Time Men Building Craftsmen | | | | Full-Time Men Building Labourers | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REGION | Weekly Earnings April 67 s | d | Ranking | REGION | Weekly Earnings April 67 s | d | Ranking | REGION (Figures in brackets indicate numbers sampled) | Weekly Earnings April 67 s | d | Ranking | REGION (Figures in brackets indicate numbers sampled) | Weekly Earnings April 67 s | d | Ranking |
| London and South Eastern | 432 | 3 | 1 | London and South Eastern | 441 | 11 | 1 | Multi-Regional (10043) | 503 | 6 | 1 | Multi-Regional (12347) | 416 | 1 | 1 |
| Midlands | 421 | 2 | 2 | Eastern and Southern | 437 | 7 | 2 | Scotland (28262) | 434 | 0 | 2 | London and South Eastern (27321) | 377 | 9 | 2 |
| Eastern and Southern | 412 | 5 | 3 | Wales | 433 | 8 | 3 | Midlands (27398) | 417 | 5 | 3 | Scotland (18073) | 371 | 8 | 3 |
| Wales | 408 | 3 | 4 | Midlands | 430 | 7 | 4 | London and South Eastern (50987) | 415 | 9 | 4 | Midlands (17382) | 358 | 6 | 4 |
| Northern | 401 | 5 | 5 | Northern | 417 | 8 | 5 | Yorks and Humber (18418) | 403 | 3 | 5 | North Western (13311) | 350 | 0 | 5 |
| North Western | 401 | 0 | 6 | South Western | 408 | 0 | 6 | Northern (12499) | 401 | 4 | 6 | Yorks and Humber (10654) | 348 | 4 | 6 |
| Scotland | 394 | 4 | 7 | North Western | 407 | 2 | 7 | North Western (22550) | 397 | 7 | 7 | Eastern and Southern (15184) | 342 | 8 | 7 |
| Yorks and Humber | 392 | 0 | 8 | Scotland | 406 | 1 | 8 | Eastern and Southern (26038) | 385 | 2 | 8 | Northern (7379) | 334 | 1 | 8 |
| South Western | 382 | 11 | 9 | Yorks and Humber | 395 | 10 | 9 | Wales (7049) | 378 | 7 | 9 | Wales (4898) | 317 | 6 | 9 |
| | | | | | | | | South Western (14269) | 354 | 0 | 10 | South Western (6859) | 313 | 3 | 10 |

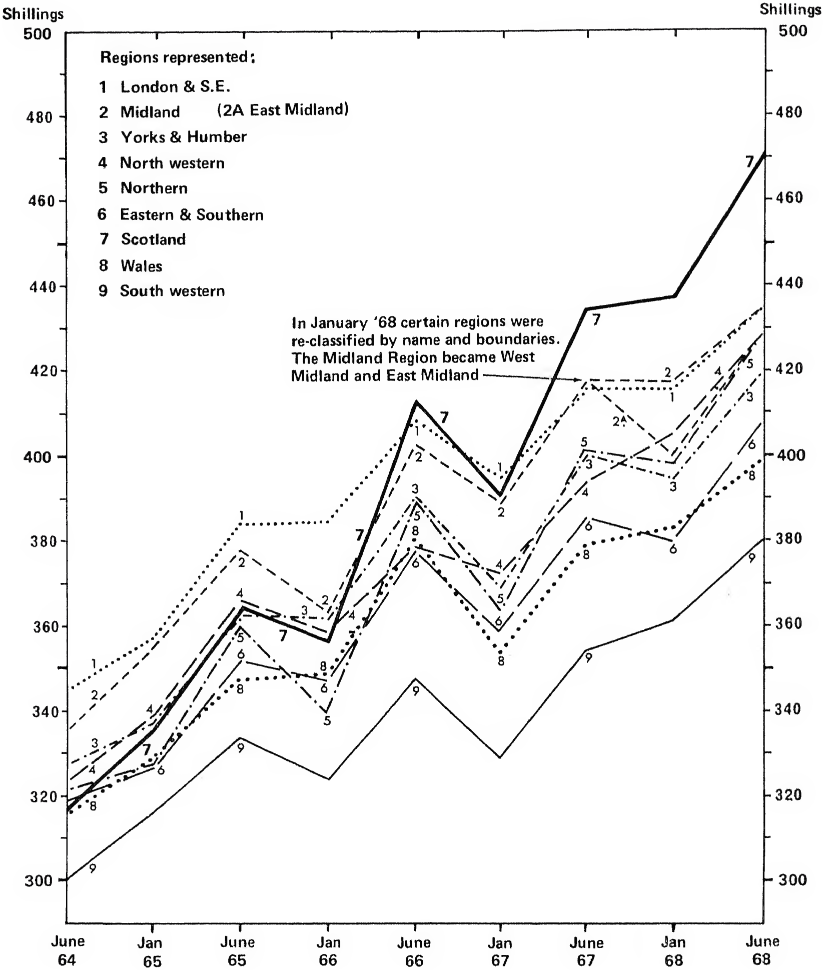
Based on D.E.P. Gazette Statistics—March 1969 and November 1967.

## Average Weekly Earnings including Overtime Premium: Building Trades Craftsmen

|  |  | 68 |  |  |  |  | 67 |  |  |  | 66 |  |  |  | 65 |  |  |  | 64 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REGION | R | June | R | Jan. | REGION | R | June | R | Jan. | R | June | R | Jan. | R | June | R | Jan. | R | June |
| South East | 3 | 435 6 | 4 | 415 6 | London and South East | 4 | 415 9 | 2 | 395 3 | 3 | 408 3 | 2 | 384 4 | 2 | 384 5 | 2 | 357 8 | 2 | 345 8 |
| East Anglia | 9 | 408 5 | 10 | 380 0 | Eastern and Southern | 8 | 385 2 | 8 | 359 10 | 8 | 378 9 | 7 | 346 9 | 8 | 351 4 | 8 | 327 5 | 7 | 318 11 |
| South West | 11 | 379 9 | 11 | 361 8 | South Western | 10 | 354 0 | 10 | 328 9 | 10 | 347 2 | 10 | 323 8 | 10 | 333 6 | 10 | 316 5 | 10 | 298 4 |
| West Midlands | 4 | 435 1 | 3 | 417 2 | Midlands | 3 | 417 5 | 3 | 388 9 | 4 | 406 8 | 3 | 365 5 | 3 | 378 1 | 3 | 354 8 | 3 | 335 2 |
| East Midlands | 7 | 428 2 | 6 | 400 1 | Yorks and Humber | 5 | 403 3 | 6 | 369 10 | 5 | 390 10 | 4 | 362 2 | 5 | 364 8 | 5 | 336 6 | 4 | 327 8 |
| York and Humber | 8 | 425 4 | 8 | 395 6 | North Western | 7 | 397 7 | 5 | 372 10 | 9 | 378 5 | 5 | 358 8 | 4 | 368 0 | 4 | 338 1 | 5 | 323 8 |
| North West | 6 | 428 5 | 5 | 405 9 | Northern | 6 | 401 4 | 7 | 363 1 | 6 | 390 3 | 9 | 341 3 | 7 | 359 8 | 9 | 327 4 | 6 | 321 3 |
| Northern | 5 | 429 10 | 7 | 398 8 | Scotland | 2 | 434 0 | 4 | 388 1 | 2 | 412 11 | 6 | 357 10 | 6 | 364 1 | 6 | 335 3 | 8 | 316 7 |
| Scotland | 2 | 465 9 | 2 | 437 4 | Wales | 9 | 378 7 | 9 | 353 5 | 7 | 380 9 | 7 | 346 9 | 9 | 346 8 | 7 | 328 3 | 9 | 316 1 |
| Wales | 10 | 398 11 | 9 | 382 9 | Multi-Regional | 1 | 503 6 | 1 | 478 8 | 1 | 502 1 | 1 | 471 5 | 1 | 463 11 | 1 | 451 9 | 1 | 407 3 |
| Multi-Regional | 1 | 535 9 | 1 | 523 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Based on D.E.P. Statistics.

Multi-regional firms are those who contract in more than one region and who are unable to prove a regional analysis.
Column "R" indicates Ranking of Earnings for each Region.
Weekly Earnings are shown in shillings and pence.



Average Weekly Earnings—Building Trades Craftsmen

Based on D.E.P. statistics

In January '68 certain regions were re-classified by name and boundaries. The Midland Region became West Midland and East Midland

## Composition of Hours and Earnings of Grades by Industry, Region, Size of Firm and Type of Work: Weekly Averages

CONSTRUCTION, PRIVATE SECTOR

July 1968

A = No. of hours or amount of pay (averaged overall)
*N = No. of operatives with each item*

BUILDING CRAFTSMEN

| Region | | Hours worked | | | | Basic pay | Overtime pay | Variable bonus | Travel pay | Condition money | Other pay | Total earnings | Hourly earnings | Basic hourly rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basic | | Overtime | | | | | | | | | | |
| | | Hrs | Mins | Hrs | Mins | £ s d | £ s d | £ s d | £ s d | £ s d | £ s d | £ s d | £ s d | £ s d |
| ALL CRAFTSMEN . . | A | 41 | 32 | 5 | 30 | 16 18 1 | 3 2 8 | 2 0 6 | 9 4 | 1 1 | 3 2 | 22 14 7 | 9 8 | 8 2 |
| | *N* | | | | | | *216,188* | *97,410* | *105,084* | *17,004* | *27,474* | *304,263* | | |
| REGION: | | | | | | | | | | | | | | |
| Northern . . . | A | 40 | 39 | 4 | 50 | 16 2 9 | 2 13 4 | 3 0 8 | 8 7 | 9 | 10 | 22 7 3 | 9 10 | 7 11 |
| | *N* | | | | | | *12,196* | *7,291* | *5,544* | *821* | *1,946* | *18,338* | | |
| Yorkshire and Humberside . | A | 41 | 28 | 5 | 29 | 16 11 3 | 3 1 5 | 1 17 0 | 9 1 | 4 | 2 1 | 22 1 5 | 9 5 | 7 11 |
| | *N* | | | | | | *20,285* | *9,460* | *8,490* | *592* | *2,588* | *27,301* | | |
| East Midlands . . | A | 42 | 02 | 4 | 33 | 17 1 5 | 2 11 4 | 1 19 10 | 8 6 | 4 | 2 0 | 22 3 6 | 9 6 | 8 1 |
| | *N* | | | | | | *13,233* | *6,686* | *6,659* | *616* | *2,027* | *21,445* | | |
| London . . . | A | 41 | 40 | 7 | 21 | 17 7 11 | 4 6 0 | 2 8 2 | 8 2 | 1 2 | 6 8 | 24 17 9 | 10 2 | 8 3 |
| | *N* | | | | | | *38,392* | *17,880* | *20,775* | *2,377* | *5,380* | *48,110* | | |
| Rest of South East . | A | 42 | 30 | 4 | 37 | 17 8 5 | 2 10 4 | 1 5 11 | 8 0 | 8 | 1 8 | 21 15 1 | 9 3 | 8 0 |
| | *N* | | | | | | *45,212* | *15,406* | *17,940* | *2,949* | *4,642* | *68,591* | | |
| South West . . | A | 41 | 43 | 3 | 30 | 16 13 6 | 1 17 10 | 12 10 | 7 4 | 1 0 | 3 1 | 19 15 8 | 8 9 | 7 11 |
| | *N* | | | | | | *12,573* | *4,029* | *5,647* | *1,218* | *1,841* | *22,012* | | |
| Wales . . . | A | 40 | 57 | 4 | 02 | 16 2 0 | 2 4 1 | 2 5 8 | 17 3 | 4 | 6 5 | 21 15 8 | 9 8 | 7 11 |
| | *N* | | | | | | *8,865* | *5,301* | *6,526* | *403* | *1,172* | *13,037* | | |
| West Midlands . . | A | 42 | 09 | 5 | 08 | 17 8 6 | 2 18 11 | 1 14 6 | 9 3 | 4 | 1 11 | 22 13 6 | 9 7 | 8 3 |
| | *N* | | | | | | *17,775* | *8,683* | *8,888* | *488* | *1,972* | *26,346* | | |
| Merseyside . . | A | 40 | 36 | 6 | 26 | 16 4 1 | 3 14 4 | 4 6 2 | 5 11 | 1 10 | 5 5 | 24 17 9 | 10 7 | 7 11 |
| | *N* | | | | | | *7,894* | *4,437* | *3,050* | *1,331* | *1,121* | *9,881* | | |
| Rest of North West . | A | 41 | 05 | 6 | 07 | 16 10 0 | 3 7 7 | 1 7 4 | 10 9 | 1 1 | 5 7 | 22 2 6 | 9 5 | 8 0 |
| | *N* | | | | | | *14,693* | *6,032* | *7,067* | *1,168* | *1,805* | *18,951* | | |
| Scotland . . . | A | 40 | 02 | 7 | 19 | 16 2 7 | 4 10 0 | 3 8 9 | 13 3 | 2 10 | 1 3 | 24 19 8 | 10 7 | 8 0 |
| | *N* | | | | | | *25,071* | *12,206* | *14,500* | *5,043* | *2,977* | *30,248* | | |

Source: N.B.P.I. Survey.

## Numbers, Hours and Composition of Average Weekly Earnings for Selected Grades of Full-week Operatives in Building by Region

A = No. of hours or amount of pay (averaged overall)
*N = No. of operatives with each item*

| Grade and region | | Hours worked | | Basic hourly rate | Basic pay | Overtime pay | Variable bonus | Travel pay | Condition money | Other pay | Total | Average hourly earnings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basic | Overtime | | | | | | | | | |
| (1) | | (2) Hrs Mins | (3) Hrs Mins | (4) s d | (5) £ s d | (6) £ s d | (7) £ s d | (8) £ s d | (9) £ s d | (10) £ s d | (11) £ s d | (12) s d |
| GENERAL LABOURERS | | | | | | | | | | | | |
| GREAT BRITAIN . . | A | 41 03 | 7 43 | 6 10 | 14 1 11 | 3 16 1 | 2 0 5 | 8 6 | 2 1 | 4 1 | 20 12 10 | 8 6 |
| | *N* | | | | | *103,525* | *57,967* | *47,290* | *13,752* | *13,294* | *123,517* | |
| Northern . . . | A | 40 21 | 5 50 | 6 8 | 13 9 5 | 2 15 7 | 2 0 3 | 7 10 | 9 | 1 6 | 18 15 1 | 8 1 |
| | *N* | | | | | *5,855* | *4,030* | *2,710* | *198* | *412* | *7,912* | |
| Yorkshire and Humberside . . | A | 40 37 | 7 43 | 6 10 | 13 17 8 | 3 15 1 | 1 16 9 | 8 4 | 2 3 | 10 | 20 0 7 | 8 3 |
| | *N* | | | | | *9,031* | *4,685* | *3,617* | *1,338* | *345* | *10,187* | |
| East Midlands . . | A | 40 47 | 6 15 | 6 10 | 14 0 2 | 3 0 3 | 1 15 7 | 7 4 | 6 | 4 7 | 19 8 1 | 8 3 |
| | *N* | | | | | *6,193* | *2,889* | *2,359* | *374* | *936* | *7,473* | |
| London . . . | A | 40 43 | 11 20 | 7 1 | 14 8 0 | 5 14 0 | 3 5 0 | 6 6 | 3 10 | 10 10 | 24 8 4 | 9 5 |
| | *N* | | | | | *19,367* | *12,412* | *9,363* | *3,382* | *4,196* | *20,913* | |
| Rest of South East . | A | 42 44 | 6 16 | 6 11 | 14 13 4 | 2 19 6 | 1 14 6 | 6 7 | 1 4 | 1 6 | 19 16 6 | 8 1 |
| | *N* | | | | | *16,553* | *8,237* | *5,284* | *1,707* | *1,399* | *21,590* | |
| South West . . | A | 41 36 | 5 29 | 6 10 | 14 4 7 | 2 12 5 | 1 0 2 | 8 10 | 5 | 1 7 | 18 7 9 | 7 10 |
| | *N* | | | | | *6,852* | *2,940* | *3,067* | *382* | *1,048* | *9,278* | |
| Wales . . . | A | 40 29 | 5 27 | 6 9 | 13 14 6 | 2 11 1 | 1 9 9 | 12 9 | 8 | 3 2 | 18 11 6 | 8 1 |
| | | | | | | *7,865* | *4,305* | *4,192* | *1,006* | *1,418* | *9,425* | |
| West Midlands . . | A | 41 07 | 6 17 | 7 0 | 14 6 3 | 3 0 4 | 1 12 11 | 8 3 | 10 | 2 11 | 19 11 3 | 8 3 |
| | *N* | | | | | *7,824* | *5,189* | *3,556* | *559* | *966* | *9,592* | |
| Merseyside . . | A | 40 50 | 8 43 | 6 11 | 14 3 0 | 4 11 6 | 2 16 5 | 7 5 | 2 8 | 7 9 | 22 8 11 | 9 1 |
| | *N* | | | | | *3,702* | *2,169* | *1,754* | *482* | *586* | *4,338* | |
| Rest of North West . | A | 41 01 | 8 06 | 6 10 | 13 19 7 | 3 18 8 | 1 3 1 | 9 3 | 3 4 | 7 7 | 20 1 1 | 8 2 |
| | *N* | | | | | *7,631* | *3,811* | *3,678* | *1,152* | *1,072* | *8,903* | |
| Scotland . . . | A | 39 49 | 9 50 | 6 9 | 13 7 9 | 5 2 7 | 2 10 1 | 12 9 | 3 9 | 1 4 | 21 17 8 | 8 10 |
| | *N* | | | | | *12,648* | *7,294* | *7,696* | *3,117* | *912* | *13,907* | |

Source: N.B.P.I. Survey
July 1968.

## Average Hours of Overtime Worked by Region, January 1968

### BUILDING TRADES CRAFTSMEN AND LABOURERS

| Region | Craftsmen | | Labourers | |
|---|---|---|---|---|
| | Average Hours actually worked including Overtime | Average Hours of Overtime Worked | Average Hours actually worked including Overtime | Average Hours of Overtime Worked |
| South East | 45·6 | 3·9 | 46·0 | 5·0 |
| East Anglia | 45·0 | 3·3 | 45·5 | 4·4 |
| South Western | 42·9 | 2·1 | 43·1 | 2·7 |
| West Midlands | 44·6 | 3·3 | 45·0 | 5·5 |
| East Midlands | 44·8 | 3·2 | 44·9 | 3·4 |
| Yorkshire and Humber | 43·6 | 3·7 | 43·6 | 5·2 |
| North Western | 43·9 | 3·7 | 44·9 | 5·3 |
| Northern | 43·2 | 3·3 | 42·7 | 3·4 |
| Scotland | 45·7 | 5·9 | 46·3 | 6·7 |
| Wales | 43·2 | 3·2 | 42·7 | 3·5 |
| Multi-Regional Firms | 47·2 | 8·6 | 49·4 | 10·5 |

Based on D.E.P. Statistics, September 1968.

TABLE 12

## Daylight available during Winter Months 1969: British Standard Time

| LOCATION with Latitude | 20th October |  |  |  | 20th November |  |  |  | 20th December |  |  |  | 20th January |  |  |  | 20th February |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Sun Rise | Sun Set | Total |  | Sun Rise | Sun Set | Total |  | Sun Rise | Sun Set | Total |  | Sun Rise | Sun Set | Total |  | Sun Rise | Sun Set | Total |  |
|  |  |  | Hrs | Mins |  |  | Hrs | Mins |  |  | Hrs | Mins |  |  | Hrs | Mins |  |  | Hrs | Mins |
| Wick 58·5°N . . | 0747 | 1742 | 9 | 55 | 0858 | 1632 | 7 | 34 | 0947 | 1607 | 6 | 20 | 0930 | 1653 | 7 | 23 | 0824 | 1805 | 9 | 41 |
| Scottish Central Belt Ave. 56°N . | 0741 | 1748 | 10 | 07 | 0844 | 1646 | 8 | 02 | 0928 | 1626 | 6 | 58 | 0915 | 1707 | 7 | 52 | 0817 | 1812 | 9 | 55 |
| Manchester 53·5°N . | 0736 | 1753 | 10 | 17 | 0833 | 1658 | 8 | 25 | 0912 | 1642 | 7 | 30 | 0903 | 1719 | 8 | 16 | 0811 | 1818 | 10 | 07 |
| Birmingham 52·5°N . | 0734 | 1755 | 10 | 21 | 0828 | 1702 | 8 | 34 | 0906 | 1647 | 7 | 41 | 0858 | 1724 | 8 | 26 | 0809 | 1820 | 10 | 11 |
| London 51·5°N . | 0732 | 1756 | 10 | 24 | 0824 | 1706 | 8 | 42 | 0902 | 1652 | 7 | 50 | 0854 | 1728 | 8 | 34 | 0807 | 1822 | 10 | 15 |
| Plymouth 50·5°N . | 0730 | 1758 | 10 | 28 | 0821 | 1710 | 8 | 49 | 0856 | 1657 | 8 | 01 | 0851 | 1732 | 8 | 41 | 0805 | 1824 | 10 | 19 |
| Civil Twilight . . | Scotland (56°N) |  |  |  | Scotland (56°N) |  |  |  | Scotland (56°N) |  |  |  | Scotland (56°N) |  |  |  | Scotland (56°N) |  |  |  |
| Can be the threshold of worthwhile daylight for outside work. | 38 mins. before Rise<br>38 mins. after Set |  |  |  | 43 mins. before Rise<br>43 mins. after Set |  |  |  | 47 mins. before Rise<br>47 mins. after Set |  |  |  | 43 mins. before Rise<br>44 mins. after Set |  |  |  | 39 mins. before Rise<br>38 mins. after Set |  |  |  |
|  | ENGLAND (52°N) |  |  |  | ENGLAND (52°N) |  |  |  | ENGLAND (52°N) |  |  |  | ENGLAND (52°N) |  |  |  | ENGLAND (52°N) |  |  |  |
|  | 34 mins. before Rise<br>34 mins. after Set |  |  |  | 38 mins. before Rise<br>38 mins. after Set |  |  |  | 40 mins. before Rise<br>41 mins. after Set |  |  |  | 38 imns. before Rise<br>39 mins. after Set |  |  |  | 35 mins. before Rise<br>35 mins. after Set |  |  |  |

Based on Data from "Nautical Almanac 1969"—H.M.S.O.

## Employment of Operatives Great Britain

First Quarter 1968 £ million

NEW HOUSING

| Size of Firm | Private Sector | | Public Sector | |
|---|---|---|---|---|
| | Amount | % of Total | Amount | % of Total |
| Nil/1 | 2·7 | 1·7 | 0·5 | 0·3 |
| 2–7 | 22·4 | 14·3 | 4·9 | 3·3 |
| 8–13 | 16·3 | 10·4 | 4·8 | 3·2 |
| 14–24 | 19·0 | 12·2 | 8·0 | 5·4 |
| 25–34 | 12·3 | 8·0 | 5·7 | 3·9 |
| 35–59 | 15·2 | 9·8 | 10·4 | 7·2 |
| 60–79 | 7·9 | 5·1 | 5·8 | 4·0 |
| 80–114 | 8·8 | 5·6 | 8·3 | 5·7 |
| 115–299 | 19·0 | 12·2 | 20·4 | 13·9 |
| 300–599 | 9·4 | 6·0 | 16·4 | 11·2 |
| 600–1,199 | 6·8 | 4·3 | 18·9 | 12·2 |
| 1,200 and over | 16·3 | 10·4 | 43·8 | 29·7 |
| Total . . | 156·1 | 100·0 | 147·9 | 100·0 |

Source: M.P.B.W. Statistics.

UNIVERSITY LIBRARY CAMBRIDGE
OP
22 AU
1970

Printed in Scotland by Her Majesty's Stationery Office Press, Edinburgh
Dd. 245187 K28 7/70 (7401)